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Serials

THE OPHTHALMIC RECORD

EDITED BY

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The November number of the Ophthalmic Record will contain, among others, an original article by W. E. Bruner, M.D.; one by Wm. E. Baxter, M.D.; one by C. D. Conkey, M.D. There will also appear reviews of the most recent contributions to Ophthalmology published here and abroad. Editorials by prominent Ophthalmologists, society reports and miscellaneous items of interest.

The Record particularly desires short practical papers on any subject connected with Ophthalmology. These will be published at as early a date as possible. It is understood that, unless otherwise arranged, original articles when accepted are contributed to the Record exclusively. Illustrative cuts will be made at the expense of the journal and proofs for correction will be sent to authors when desired. Reprints with covers are furnished at cost. One hundred of these will be presented to authors *gratis* when a request for them is written on the original manuscript. The Record will be issued monthly and each number will contain about 54 pages of reading matter.

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TABLE OF CONTENTS.

I. ORIGINAL ARTICLES.

1. Surgical Treatment of Excessive Myopia, *by* **Robert Sattler, M. D.,** *Cincinnati, Ohio* ---- 487
2. Emmetropia, or Corrected Ametropia, *by* **Norburne B. Jenkins,** *Knoxville, Tenn* ---- 490
3. A Case of Quinine Amaurosis, *by* **James Moores Ball, M.D.,** *St. Louis, Mo.* (Illustrated) ---- 496
4. Ocular Therapeutics—A report *by* **Melville Black,** *Denver, Col.* ---- 499
5. Parinaud's Conjunctivitis, *by* **Frank W. Miller,** *Red Oak, Iowa* ---- 502
6. A New Treatment for Trachoma—Preliminary report *by* **George F. Keiper, A.M., M. D.,** *Lafayette, Ind.* (Illustrated) ---- 503
7. A Satisfactory Method of Removing Powder Stains in Fresh Cases, *by* **J. W. Heustis, M.D.,** *Dubuque, Iowa* ---- 505

II. EDITORIALS.

1. To Our Readers ---- 507
2. The Apparent Size of the Erect Image of the Optic Disk ---- 507
3. The Education of the Ophthalmologist ---- 509
4. Some Aspects of the Trachoma Question ---- 510

III. REPORTS OF SOCIETIES.

1. Section on Ophthalmology, British Medical Association ---- 513

IV. REVIEWS.

1. Concerning the Occurence of Micro-Organisms Resembling Diphtheria Bacilli (Xerosi Bacilli, Segmented Bacilli En Massue, etc.), in the Conjunctival Sac, Especially the Normal Conjunctiva, together with a Contribution Regarding the Early Diagnosis of Diphtheria, *by* **Dr. Hans Heinersdorff,** *Archiv für Ophth* ---- 517
1. The Etiology and Educative Treatment of Convergent Strabismus, *by* **Priestley Smith, M.R.C.S.,** *British Med. Journal* ---- 522

V. MISCELLANEOUS.

1. Short Abstracts from Other Journals ---- 534

VI. NEWS ITEMS.

1. Personals, etc., of Interest to the Profession ---- 536

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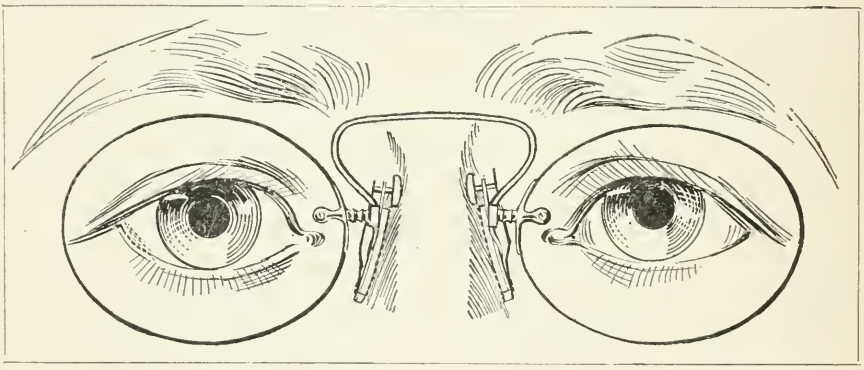

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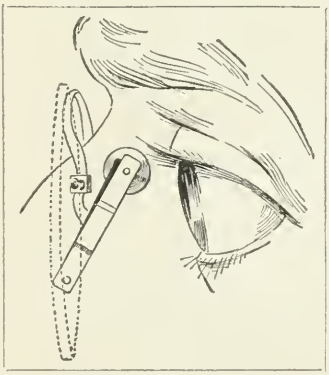

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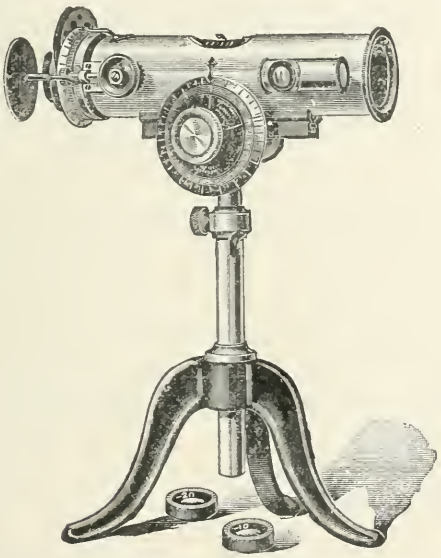

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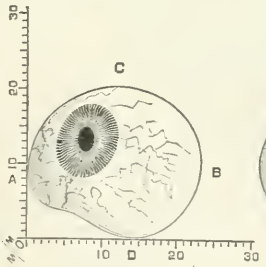

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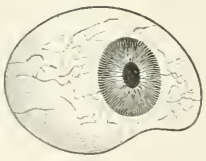

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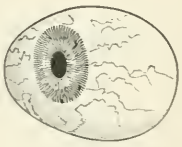

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THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, OCTOBER, 1898. NO. 10. NEW SERIES

ORIGINAL ARTICLES.

THE SURGICAL TREATMENT OF EXCESSIVE MYOPIA.

ROBERT SATTLER, M.D.

OF CINCINNATI, OHIO.

It was my intention to withhold for the present the report of this case and to include it later on with others which might be added, after additional experience with the surgical method for high myopia had been acquired. If I am led to mention it briefly at this meeting it is with the hope that it may encourage others, as it has me, to give to this method more deliberate and considerate attention and to seek opportunities to put it to the test in suitable cases. It is a subject which should and must have for us all an absorbing interest.

Two of the most gratifying results following double extraction of immature senile cataract, or sclerosis of the lenses, were observed in two old persons, both excessively myopic. The one, an old man, who formerly or since his earliest manhood, wore —10D. sph., was able after the operation to dispense with distance glasses and to resort only for reading to +1.75D. sph. The other patient formerly was aided by —16D. sph., but even with these she was not able to see for twelve or fifteen years before the operation as distinctly as she saw without any glasses or with —1.25D, sph. afterward. She could read without the assistance of lenses.

These two cases, and a visit to the clinics at Halle and Vienna in 1895. determined me to seek and to find the necessary opportunities to test this method in favorable cases on my return to this country. But even at my hospital and dispensary clinics and in private practice as well, so many

difficulties were encountered among the few cases which were considered favorable for the operation, that during the intervening period only four cases were discovered. These were only with difficulty persuaded to have the operation performed.

So far as concerns this patient, or last case, the question whether it was really a case of excessive myopia suggested itself to me at once, after the favorable outcome of surgical interference was disclosed. Before surgical intervention it certainly had to be classed with the cases of excessive myopia. It presented all the clinical and ophthalmoscopic characteristics of these cases. The patient was practically blind without the assistance of strong concave lenses, —16D., which only afforded her vision of 0.2. She was not able to read without the aid of these same strong lenses, and with them so much difficulty was experienced that she was unable to attend school or acquire an education, much to her own sorrow and that of her mother, an exceptionally intelligent woman.

There were no uncommon ophthalmoscopic evidences, the refractive media was found clear and the cornea, on examination with the astigmometer, also free from marked irregularity of curvature. She was regarded as amblyopic in addition to the high myopic deformity. Subsequent developments, after removal of the lenses, however, proved conclusively that this was an erroneous conclusion, and that, on the contrary, she had normal perceptive ability of the retina in both eyes.

My explanation for the fortunate outcome in this case is that it was one of congenital malformation of the lenses, with preservation of their transparency, but altered indices of refraction of different sectors, associated with a moderate myopic deformity.

It is evident that such cases must necessarily be classed with those of excessive myopia, owing to their inseparable resemblance, and for the latter as well as the former ones, surgery alone affords relief. It is equally certain that in these exceptional ones the results of surgical treatment will be more favorable.

It would appear, however, that in this country there exists a marked scarcity of number, so far as these cases of excessive myopia are concerned, and which must occasionally include just such cases as the present one, for which surgical interference, having for its purpose the removal of the lens, is indicated. This method has, as we know, been practiced on such a large and successful scale in Europe.

We cannot even at our clinics and hospitals have command over our patients as is done abroad. Lengthy explanations are necessary to gain for the surgical treatment the consent of patients or that of their parents, and

this to many surgeons is an irksome task. It may have happened that those cases which yielded to the advice and submitted to the operation were not as gratifying in their final results as was expected. These are among the probable explanations, and rather point to a lack of opportunity than a lack of interest for this comparatively new surgical departure. From a limited experience I take the history of this recent and last case:

Bessie S., æt. 16, Cincinnati, O.—Has been under my observation since early childhood. Hers was regarded as a case of congenital myopia, associated with a high degree of amblyopia. She had two brothers; both were excessively myopic, but the amblyopia did not appear so pronounced. Her father had a slight hypermetropic error, but his eyes were healthy and vision perfect. Her mother had compound myopic astigmatism, but with corrective lenses vision was excellent. Her maternal grandfather was myopic and three of her aunts. At the age of eight she was given —12D. After a careful test and ophthalmoscopic measurement, as nearly as could be determined she had a vision of about 0.1. Ophthalmoscopic examination disclosed only such changes at the posterior pole common to the myopic structure, and healthy and transparent dioptric media. Last year, under atropine, a careful re-examination of the refraction was made and also of the media and internal structures, lest the presence of a possible lenticonus or other lesion of the dioptric media or fundus might have eluded discovery. The results of former examinations were confirmed, nothing new developed, and only a higher correction, —16D., which afforded her almost 0.2 vision with either eye, was presented. About this time the operative treatment of myopia was explained to her mother and strongly urged and advised by me, and after much hesitation consented to.

The treatment by subsequent discissions after the first traumatism resulting in cataract was inflicted, proceded uneventfully and effected in both eyes complete absorption of the lenses. It was expected that the refraction would remain more or less myopic, after complete recovery had come about, owing to the apparently high degree of the error, but tests proved the contrary. July 2, 1898, confirmed a former examination, which disclosed H. 4.5 D, V=0.6 R. E. and H. 5 ⊃ Ha 1 ang. 70 L. E., V=0.6. Corresponding lenses were prescribed for distance, and in addition +3 5D. sph. one-half size lenses in grab frames, to be worn over her distance glasses for reading and close work. With their assistance she reads, at good range, without difficulty Sn. 1.

The Groton, Cincinnati, O.

Dr. George Ferdinands reports two cases of sympathetic ophthalmitis remarkable for the length of time that elapsed between the enucleation of the fellow eye for injury and the development of the sympathetic trouble—in one case eighteen years, and in the other about twenty-one years. The interval in the latter case is without precedent.—*British Medical Journal.*

EMMETROPIA, OR CORRECTED AMETROPIA.

BY NORBURNE B. JENKINS, M.D.

KNOXVILLE, TENN.

The table of Donders' and the following conclusions with regard to the recession of the near point are mainly based upon the investigations of that author, and have been for about half a century accepted by the medical profession: "After the age of 42 the near point recedes beyond twenty-two centimeters, and there is then present in the emmetropic eye presbyopia, which is corrected by such convex lens as will bring the near point back to twenty-two centimeters; after the age of 45 convex lenses are needed for reading and near work by all persons with emmetropic eyes; after the age of 45 myopia exists in those individuals whose near point is less than twenty-two centimeters; some emmetropes require convex lenses for reading or near work as early as the age of 40."

From more recent observation it seems quite probable that until the fifty-fifth year the near point of an emmetrope, or of a completely corrected ametrope, does not recede beyond twenty-two centimeters, and it is equally probable that in ametropic persons under the age of 55, lenses of the same focus can be worn for near or distant vision.

The following is the table which is generally accepted as the index to the presbyopia of the emmetropic eye:

Age.	P. Required.	P. Existing.	Presbyopia.
40	4.5	4.5	0
45	4.5	3.5	1.0
50	4.5	2.5	2.0
55	4.5	1.5	3.0
60	4.5	0.5	4.0
65	4.5	0.25	4.25
70	4.5	−1.0	5.5
75	4.5	−1.75	6.25
80	4.5	−2.5	7.0

The following is offered as a revision of the foregoing:

(Emmetropia, or Corrected Ametropia.)

Age.	Additional Lens Required.		
55	0.	to	0.50
60	0.	"	1.50
65	0.	"	2.25
70	0.50	"	2.75
75	0.75	"	3.50
80	1.50	"	4.00

Herewith is given an excerpt from Donders' table showing the recession of the near point:

Age	12	20	25	30	35	40	45	50	55
Centimeters	8	10	12	14	18	25	30	43	100

The revision below is thought to be more accurate:

(Emmetropia, or Corrected Ametropia.)

Age	15	20	30	35	40	45	50	55
Centimeters	?	7	10	12	14	16	19	24

When not complicated by pathological conditions, ametropia, in persons under 55 years of age, should not be considered as perfectly corrected if the distant vision, in the absence of accommodative effort, be less than six-sixths (six-sixths to six-ninths after the sixty-fifth year) with near vision lenses.

The above tables and conditions apply only when the latent ametropia is absolutely corrected in both eyes to within one-fourth of a diopter. Careful observation reveals the surprising fact that in a very large percentage of persons, regardless of age, there is present some form of latent ametropia.

From the above tables it may be seen that it is possible an individual with a simple binocular myopia of 3 D., possibly less, would not after middle age require lenses for near vision.

The foregoing conclusions are based upon the assumption that a "vision of six-sixths," (six-sixths to six-ninths after the sixty-fifth year) "in the absence of accommodative effort, constitutes emmetropia, or corrected ametropia." In these investigations, which were chiefly confined to ametropic cases, the astigmatism, when present, was first considered completely corrected, after which were added to the cylindrical correction, the strongest convex lenses or the weakest concave lenses, with which six-sixths (six-sixths to six-ninths after the sixty-fifth year) could be read.

In casually investigating these claims it would be well to select subjects from 50 to 60 years of age, who have not used lenses for near vision. It will be found that only a small percentage are myopic, the remainder most likely being emmetropic, or a trifle ametropic, and having a vision of six-sixths without the aid of concave lenses.

Binocular emmetropia is probably more of a rarity than is generally supposed. Perhaps one-tenth of 1 per cent, to 1 per cent. of individuals are so fortunate as to be emmetropic.

With the methods at present recommended by the text-books it is possible, with the exception of simple myopia, that a true estimate of ametropia is seldom obtained.

The following is a partial record of 100 consecutive cases of refraction, a careful review of which will give an idea as to the important rôle that latent ametropia plays in the recession of the near point:

Case I. Mrs. ——, aet. 45. R. V. 6/5; 6/6 with+1.50S. L. V. 6/5; 6/6 with +1.50S. Near point seventeen cm.

Case II. Mrs. ——, aet. 63. R. V. 6/5; 6/6 with+1.25S. L. V. 6/5; 6/6 with +1.25S. Near point sixteen cm.

Case III. Mr. ——, aet. 20. R. V. 6/4; 6/6 with+1.75S.⊃—0.25C. ax. 77°. L. V. 6/4; 6/6 with+1.62S. Near point seven cm.

Case IV. Mr. ——, aet. 28. R. V. 6/4; 6/6 with+2.50S. L. V. 6/4; 6 6 with+2.50S. Near point eight cm.

Case V. Mr. ——, aet. 33. R. V. 6/8; 6/6 with+1.00S.⊃—1.50C. ax. 97°. L. V. 6/8; 6/6 with+1.00S.⊃—1.00C. ax. 160°. Near point ten cm.

Case VI. Mr. ——, aet. 31. R. V. 6/6; 6/6 with+1.75S.⊃—1.00C. ax. 180°. L. V. 6/6; 6/6 with+1.75S.⊃—0.50C. ax. 180. Near point ten cm.

Case VII. Mrs. ——, aet. 37. R. V. 6/15; 6/6 with+5.00S.⊃—0.50C. ax. 105°. L. V. 6/15; 6/6 with+5.50S.⊃—1.00C. ax. 90°. Near point eight cm.

Case VIII. Mrs. ——, aet. 42. R. V. 6/6; 6/6 with+2.50S.⊃—1.25C. ax. 80°. L. V. 6/6; 6/6 with +2.50S.⊃—1.00C. ax. 105°. Near point fifteen cm.

Case IX. Miss ——, aet. 21. R. V. 6/4; 6/6 with+1.62S.⊃—0.50C. ax. 90°. L. V. 6/6; 6/6 with+1.87S.⊃—0.75C. ax. 67°. Near point six cm.

Case X. Mr. ——, aet. 36. R. V. 6/20; 6/8 with+7.00S.⊃—2.00C. ax. 30°. L. V. 6/15; 6/6 with+7.00S.⊃—2.75C. ax. 180°. Near point twelve cm.

Case XI. M. ——, aet. 75. R. E. Amblyopia. L. V. No record; 6/6 with +3.00S.⊃—1.25C. ax. 118°. Near vision with+4.75S.⊃—1.25C. ax. 118°.

Case XII. Mr. ——, aet. 53. R. V. 6/10; 6/6 with+2.50S.⊃—1.75C. ax. 25°. L. V. 6/8; 6/6 with+1.75S.⊃—1.00C. ax. 160°. Near point twenty cm.

Case XIII. Mrs. ——, aet. 45. R. V. 6/5; 6/6 with+2.00S.—⊃—0.50C. ax. 72°. L. E. Detached retina. Near point seventeen cm.

Case XIV. Mrs. ——, aet. 32. R. V. 6/5; 6/6 with+3.25S.⊃—0.50C. ax. 90°. L. V. 6/5; 6/6 with+3.50S.⊃—0.62C. ax. 90°. Near point eight cm.

Case XV. Mr. ——, aet. 22. R. V. 6/4; 6/6 with+1.50S.⊃—0.37C. ax. 180°. L. V. 6/5; 6/6 with+1.75S.⊃—0.75C. ax. 5°. Near point eight cm.

Case XVI. Mr. ——, aet. 47. R. V. 6/5; 6/6 with+2.00S.⊃—0.75C. ax. 90°. L. E. Amblyopia. Near point eighteen cm.

Case XVII. Miss ——, aet. 22. R. V. 6/15; 6/6 with—1.00C. ax. 180°. L. V. 6/18; 6/6 with—0.25S.⊃—1.00C. ax. 180°. Near point six cm.

Case XVIII. Mr. ——, aet. 24. R. V. 3/45; 6/6 with—5.75S.⊃—0.62C. ax. 180°. L. V. 3/45; 6/6 with—5.12S.⊃—0.62C. ax. 180°. Near point six cm.

Case XIX. Miss ——, aet. 18-24. R. V. 6/5; 6/6 with+2.00S. L. V. 6/5; 6/6 with+2.00S. Near point seven cm.

Case XX. Mrs. ——, aet. 58. R. V. 6/5; 6/6 with+2.00S.⊃—0.62C. ax. 180°. L. V. 6/10; 6/6 with+2.50S.⊃—1.50C. ax. 30°. Near point twenty cm.

Case XXI. Mrs. ——, aet. 53. R. V. 6/10; 6/6 with+3.25S.⊃—0.75C. ax. 90°. L. V. 6/10; 6/6 with+3.25S.⊃—0.75C. ax. 75°. Near point twenty cm.

Case XXII. Mr. ——, aet. 24. R. V. 6/5; 6/6 with+0.50S.⊃—0.50C. ax. 40°. L. V. 6/5; 6/6 with+0.50S.⊃—0.50C. ax. 97°. Near point eight cm.

Case XXIII. Miss ——, aet. 16. R. V. No record; 6/6 with+3.50S.⊂—0.50C. ax. 5°. L. V. No record; 6/6 with+4.50S. Near point six cm.

Case XXIV. Miss ——, aet. 19–24. R. V. 6/5; 6/6 with+2.75S.⊂—0.62C. ax. 180°. L. V. 6/5; 6/6 with+2.75S.⊂—0.25C. ax. 180°. Near point five cm.

Case XXV. Miss ——, aet. 16. R. V. 6/5; 6/6 with+1.75S.⊂—0.50C. ax. 100°. L. V. 6/5; 6/6 with+1.62S.⊂—0.37C. ax. 75°. Near point seven cm.

Case XXVI. Mr. ——, aet. 65. R. E. Amblyopia. L. V. 6/15; 6/6 with+5.00S.⊂—2.50C. ax. 20°. Near point seventeen cm.

Case XXVII. Mr. ——, aet. 37. R. V. 6/15; 6/6 with+2.00S.⊂—2.00C. ax. 95°. L. E. Leucoma. Near point seven cm.

Case XXVIII. Mr. ——, aet. 33. R. V. 6/5; 6/6 with+2.00S.⊂—1.00C. ax. 90°. L. E. Amblyopia exanopsia. Near point ten cm.

Case XXIX. Mr. ——, aet. 32. R. V. 3/40; 6/6 with—1.00S.⊂—1.50C. ax. 75°. L. V. 6/4; 6/6 with+1.50S. Near point ten cm.

Case XXX. Miss ——, aet. 16. R. V. 6/20; 6/8 with+8.00S.⊂—6.00C. ax. 180°. L. V. 6/30; 6/8 with+8.00S.⊂—6.00C. ax. 180°. Near point six cm.

Case XXXI. Mr. ——, aet. 45. R. V. 6/20; 6/6 with+2.00S.⊂—2.25C. ax. 95°. L. V. 6/9; 6/6 with+1.50S.⊂—1.25C. ax. 95°. Near point thirteen cm.

Case XXXII. Miss ——, aet. 11. R. V. 6/5; 6/6 with+1.50S. L. V. 6/5; 6/6 with+1.50S. Near point six cm.

Case XXXIII. Mr. ——, aet. 25. R. V. 6/6; 6/6 with+1.25S. L. V. 6/6; 6/6 with+1.50S.⊂—0.50C. ax. 17°. Near point seven cm.

Case XXXIV. Miss ——, aet. 27. R. V. 6/5; 6/6 with+2.50S. L. V. 6/6; 6/6 with+2.50S. Near point seven cm.

Case XXXV. Miss ——, aet. 12. R. V. 6/4; 6/6 with+3.00S.⊂—1.00C. ax. 90°. L. V. 6/4; 6/6 with+3.00S.⊂—1.00C. ax. 90°. Near point five cm.

Case XXXVI. Mrs. ——, aet. 35. R. V. 6/30; 6/6 with+1.50S.⊂—2.75C. ax. 180°. L. V. 6/30; 6/6 with+1.37S.⊂—2.00C. ax. 180°. Near point eleven cm.

Case XXXVII. Mrs. ——, aet. 43. R. V. 6/5; 6/6 with+2.25S.⊂—0.50C. ax. 75°. L. V. 6/5; 6/6 with+2.00S. Near point sixteen cm.

Case XXXVIII. Mr. —— , aet. 22. R. V. 6/8; 6/6 with+6.00S. L. V. 6/8; 6/6 with+6.00S. Near point seven cm.

Case XXXIX. Mrs. ——, aet. 40. R. V. 6/5; 6/6 with+3.50S. L. V. 6/5; 6/6 with+3.50S. Near point thirteen cm.

Case XL. Mr. ——, aet. 14. R. V. 6/4; 6/6 with+2.00S. L. V. 6/4; 6/6 with+2.00S. Near point six cm.

Case XLI. Mrs. ——, aet. 26. R. V. 6/5; 6/6 with+2.00S. L. V. 6/5; 6/6 with+2.00S. Near point eight cm.

Case XLII. Miss ——, aet. 14. R. V. 6/4; 6/6 with+1.62S.⊂—0.75C. ax. 112°. L. V. 6/4; 6/6 with+1.37S.⊂—0.25C. ax. 90°. Near point six cm.

Case XLIII. Mrs. ——, aet. 54. R. V. 6/10; 6/6 with+2.75S. L. V. 6/10; 6/6 with+2.75S. Near point fourteen cm.

Case XLIV. Mr. ——, aet. 13. R. V. 6/5; 6/6 with+2.00S.⊂—0.50C. ax. 180°. L. V. 6/5; 6/6 with+1.50S.⊂—0.50C. ax. 165°. Near point six cm.

Case XLV. Mr. ——, aet. 33. R. V. 6/4; 6-6 with+2.25S.⊂—0.50C. ax. 180°. L. V. 6/4; 6/6 with+2.12S.⊂—0.50C. ax. 180°. Near point ten cm.

Case XLVI. Mr. ——, aet. 28. R. V. 6/4; 6/6 with+2.00S. L. V. 6/4; 6/6 with+2.00S. Near point seven cm.

Case XLVII. Mrs. ——, aet. 31. R. V. 6/8; 6/6 with+2.00S.⊂—1.50C. ax. 170°. L. V. 6/8; 6/6 with+2.00S.⊂—1.75C. ax. 5°. Near point eight cm.

Case XLVIII. Miss ——, aet. 21. R. V. 3/50; 6/6 with—2.25S. L. V. 2/50; 6/6 with—4.00S. Near point six cm.

Case XLIX. Miss ——, aet. 48. R. V. 6/35; 6/6 with+0.25S.⊂—1.75C. ax. 132°. L. V. 6/35; 6/6 with—0.12S.⊂—1.00C. ax. 30°. Near point twenty cm.

Case L. Miss ——, aet. 20. R. V. 6/6; 6/6 with+1.50S.⊂—1.00C. ax. 180°. L. V. 6/5; 6/6 with+1.00S. Near point eight cm.

Case LI. Mr. ——, aet. 27. R. V. 6/6; 6/6 with+3.50S. L. V. 6/6; 6/6 with +3.75S. Near point seven cm.

Case LII. Mrs. ——, aet. 24. R. V. 6/4; 6/6 with+1.50S. L. V. 6/4; 6/6 with+1 50S. Near point eight cm.

Case LIII. Mr. ——, aet. 34. R. V. 6/4; 6/6 with+2.25S. L. V. 6/4; 6/6 with+2.25S. Near point eleven cm.

Case LIV. Mr. ——, aet. 23. R. V. 6/4; 6/6 with+2 25S.⊂—0.50C. ax. 75°. L. V. 6/4; 6/6 with+2.25S.⊂—0.50C, ax. 105°. Near point eight cm.

Case LV. Mr. ——, aet. 14. R. V. 6/5; 6/6 with+1.50S. L. V. 6/8; 6/6 with+2.25S.⊂—1.00C. ax. 100°. Near point six cm.

Case LVI. Mr. ——, aet. 31. R. V. 6/4; 6/6 with+1.37S ⊂—0.50C. ax. 165°. L. V. 6/4; 6/6 with+1.50S.⊂—0.37C. ax 15°. Near point nine cm.

Case LVII. Miss ——, aet. 19. R. V. 6/4; 6/6 with+2.00S. L. V. 6/4; 6/6 with+2.00S. Near point six cm.

Case LVIII. Mrs. ——, aet. 43. R. V. 6/5; 6/6 with+2.00S. L. V. 6/5; 6/6 with+2.00S. Near point 15 cm.

Case LVIX. Miss ——, aet. 17. R. V. 6/10; 6/6 with+0.50S.⊂—1.25C. ax. 105°. L. V. 6/12; 6/6 with+1.00S.⊂—1.75C. ax. 75°. Near point six cm.

Case LX. Mr. ——, aet. nineteen. R. V. 1/50; amblyopia exanopsia. L. V. 6/6; 6/6 with+3.75S.⊂—1.00C. ax. 165°. Near point six cm.

Case LXI. Mr. ——, aet. 23. R. V. 6/4; 6/6 with+1.75S.⊂—0.62C. ax. 5°. L. V. 6/4; 6/6 with+1.75S.⊂—0.62C. ax. 165°. Near point seven cm.

Case LXII. Mr. ——, aet. 27. R. V. 6/4; 6/6 with+1.50S. L. V. 6/4; 6/6 with+1.62S.⊂—0.37C. ax. 85°. Near point nine cm.

Case LXIII. Miss ——, aet. 14. R. V. 6/6; 6/6 with+3.75.⊂—2.50C. ax. 180°. L. V. 6/6; 6/6 with+3.75S.⊂—2.00C. ax. 10°. Near point six cm.

Case LXIV. Mr. ——, aet. 73. R. V. 6/50; 6/8 with+3.50S.⊂—1.00C. ax. 75°. Near vision with+5.50S.⊂—1.00X. ax. 75°. L. E. Amblyopia.

Case LXV. Miss ——, aet. 23. R. V. 6/4; 6/6 with+1.37S.⊂—0.62C. ax. 98°. L. V. 6/4; 6/6 with+1.62S.⊂—1.12C. ax. 83°. Near point seven cm.

Case LXVI. Mrs. ——, aet. 68. R. V. 6/15; 6/6 with+3.00S. Near vision with+4.75S. L. V. 6/15; 6/6 with+3.50S. Near vision with+5.25S.

Case LXVII. Miss ——, aet. 25. R. V. 6/4; 6/6 with+1.75S. L. V. 6/4; 6/6 with+1.75S. Near point eight cm.

Case LXVIII. Mr. ——, aet. 34. R. V. 6/4; 6/6 with+1.75S. L. V. 6/4; 6/6 with+1.75S. Near point eight cm.

Case LXIX. Mrs. ——, aet. 28. R. V. No record; 6/6 with+1.00S.⊂—3.25C. ax. 180°. L. V. No record; 6/6 with+1.00S.⊂—2.50C. ax. 180°. Near point eight cm.

Case LXX. Mrs. ——, aet. 52. R. V. 6/6; 6/6 with+3.25S.⊂—2.00C. ax. 180°. L. V. 6/6; 6/6 with+3.50S.⊂—1.75C. ax. 170°. Near point fifteen cm.

Case LXXI. Mr. ——, aet. 43. R. V. 6/5; 6/6 with+2.75S. L. V. 6/5; 6/6 with+2.50S. Near point thirteen cm.

Case LXXII. Mrs. ——, aet. 33. R. V. 6/5; 6/6 with+1.75S. L. V. 6/5; 6/6 with+1.75S. Near point eleven cm.

Case LXXIII. Mr. ——, aet. 27. R. V. 6/4; 6/6 with+1.50S. L. V. 6/8; 6/6 with+2.00S.—0.62C. ax. 77°. Near point eight cm.

Case LXXIV. Miss ——, aet. 23. R. V. 6/5; 6/6 with+3.00S. L. V. 6/12, 6/6 with+4.00S.⊂—0.75C. ax. 85°. Near point seven cm.

Case LXXV. Miss ——, aet. 21. R. V. 6/4; 6/6 with+1.75S.⊂—0.62C. ax. 162°. L. V. 1/50; Aphakia. Near point six cm.

Case LXXVI. Miss ——, aet. 22–28. R. V. 6/4; 6/6 with+1.62S. L. V. 6/4; 6/6 with+1.75S.⊂—0.25C. ax. 180°. Near point eight cm.

Case LXXVII. Mr. ——, aet. 27. R. V. 6/4; 6/6 with+1.75S.⊂—1.00C. ax. 93°. L. V. 6/4; 6/6 with+1.62S.⊂—0.75C. ax. 82°. Near point eight cm.

Case LXXVIII. Mrs. ——, aet. 58. R. V. No record; 6/6 and near vision with+4.00S.⊂—1.00C. ax. 17°. L. V. No record; 6/6 and near vision with+5.00S. ⊂—1.00C. ax. 105°.

Case LXXIX. Mrs. ——, aet. 27. R. V. 6/5; 6/6 with+3.25S. L. V. 6/5; 6/6 with+3.25S. Near point eight cm.

Case LXXX. Mr. ——, aet. 49. R. V. 6/6; 6/6 with+0.25S. L. E. Leucoma. Near point fourteen cm.

Case LXXXI. Mrs. ——, aet. 74. R. V. 6/8; 6/6 with+2.00S. L. V. 6/8; 6/6 with+2,00S. Near point twenty cm.

Case LXXXII. Mr. ——, aet. 33. R. V. 6/20; 6/6 with+0.75S.⊂—3.00C. ax. 14°. L. V. 6/20; 6/6 with+1.12S.⊂—2 50C. ax. 169°. Near point ten cm.

Case LXXXIII. Miss ——, aet. 17. R. V. 6/5; 6/6 with+2.00S. L. V. 6/5; 6/6 with+2.00S. Near point seven cm.

Case LXXXIV. Dr. ——, aet. 28. R. V. 6/6; 6/6 with+5.75S. L. E. Amblyopia exanopsia. Near point eight cm.

Case LXXXV. Miss ——, aet. 21. R. V. 6/5; 6/6 with+1.75S.⊂—1.50C. ax. 180°. L. V. 6/5; 6/6 with+1.75S.⊂—1.25C. ax. 180°. Near point seven cm.

Case LXXXVI. Miss ——, aet. 11. R. V. 6/5; 6/6 with+3.00S. L. V. 6/6; 6/6 with+3.00S. Near point five cm.

Case LXXXVII. Mr. ——, aet. 20. R. V. 6/4; 6/6 with+2.00S. L. V. 6/4; 6/6 with+2.00S. Near point seven cm.

Case LXXXVIII. Dr. ——, aet. 23. R. V. 6/4; 6/6 with+1.25S. L. V. 6/4; 6/6 with+1.00S. Near point seven cm.

Case LXXXIX. Miss ——, aet. 21. R. V. 6/5; 6/6 with+3.00S. L. V. 6/5; 6/6 with+3.00S. Near point eight cm.

Case XC. Mr. ——, aet. 59. R. V. 6/8; 6/6 with+1.50S.⊂—0.50C. ax. 125°. Near vision with+1.75S.⊂—0.50C. ax. 1.25°. L. E. Atrophy of zonula. Dislocation of lens.

Case XCI. Miss ——, aet. 19. R. V. 6/5; 6/6 with+1.75S. L. V. 6/5; 6/6 with+1.75S. Near point seven cm.

Case XCII. Mr. ——, aet. 19. R. V. 6/5; 6/6 with+3.50S. L. V. 6/5; 6/6 with+3.50S. Near point seven cm.

Case XCIII. Mrs. ——, aet. 45-60. R. V. 6/12; 6/6 with+3.50S.⊂—0.75C. ax. 180°. L. V. 6/12; 6/6 with+3.75S.⊂—1.25C. ax. 170°. Near point eighteen cm.

Case XCIV. Mr. ——, aet. 22. R. V. 6/4; 6/6 with+1.12S. L. V. 6/4; 6/6 with+1.50S.⊂—0.75C. ax. 83°. Near point seven cm.

Case XCV. Miss ——, aet. 23. R. V. 6/5; 6/6 with+1.50S.⊂—0.25C. ax. 170°. L. V. 6/5; 6/6 with+1.50S.⊂—0.25C. ax. 10°. Near point seven cm.

Case XCVI. Dr. ——, aet. 30. R. V. 6/5; 6/6 with+2.00S.⊂—1.00C. ax. 180°. L. V. 6/5; 6/6 with+1.75S.⊂—0.50C. ax. 25°. Near point ten cm.

Case XCVII. Mr. ——, aet. 8. R. V. 6/8; 6/6 with+3.00S. L. V. 6/8; 6/6 with+3.00S. Near point five cm.

Case XCVIII. Mrs. ——, aet. 25. R. V. 6/5; 6/6 with+1.50S.⊂—0.50C. ax. 2°. L. V. 6/5; 6/6 with+1.87S.⊂—0.62S. Near point eight cm.

Case XCIX. Mrs. ——, aet. 82. R. V. 6/9; 6/6 with+4.50S. Near vision with+8.00S. L. V. 6/12; 6/8 with+5.00S. Near vision with+8.50S.

Case C. Mr. ——, aet. 32. R. V. 6/5; 6/6 with+2.75S. L. V. 6/5; 6/6 with +2.25S. Near point nine cm.

A CASE OF QUININE AMAUROSIS.

BY JAMES MOORES BALL, M.D.

ST. LOUIS, MO.

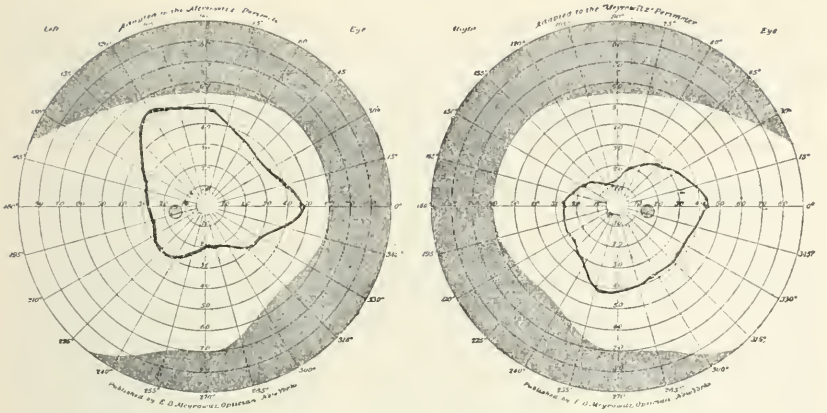
Professor of Ophthalmology in the St. Louis College of Physicians and Surgeons, Oculist to the St. Louis City Hospital.

Illustrated.

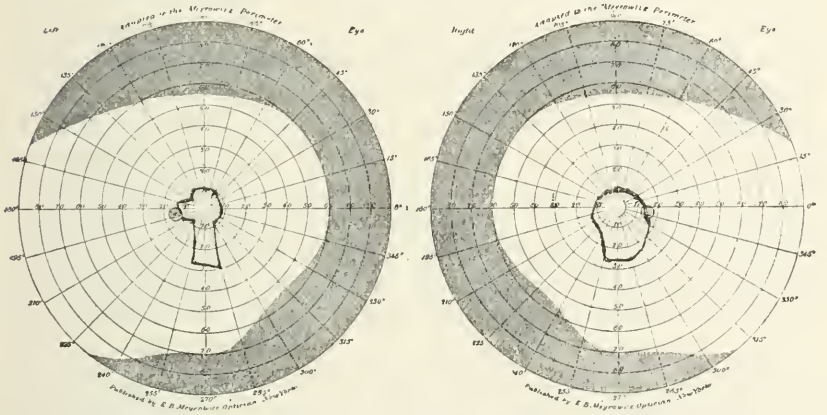
Frederick H——, aged 61, German, of strong physique, horse-collar maker by trade; was admitted to the St. Louis City Hospital March 28, 1897. He has always had good health, except that he has had an ulcer of the leg for a long time, and has suffered from malaria for several succeeding summers. He has been in the St. Louis City Hospital for treatment of the ulcer.

Recently he had malarial fever. He was given 60 grains of quinine in pill form in twelve hours. The next morning he was totally blind. I saw him on the third day after the ingestion of the drug. He was very deaf; both pupils widely dilated and irresponsive to light; vision reduced to perception of light in right eye, fingers counted at four inches with left; tension normal. The ophthalmoscope showed marked contraction of the retinal vessels, both arteries and veins. The optic papilla was somewhat pale, as was also the retina. I must remark, however, that with the exception of the contraction in the caliber of the vessels, the ophthalmoscopic changes were not as marked as I had expected to find. No doubt if the examination could have occurred within a few hours after the quinine was taken the papilla would have been white, and the retina almost bloodless.

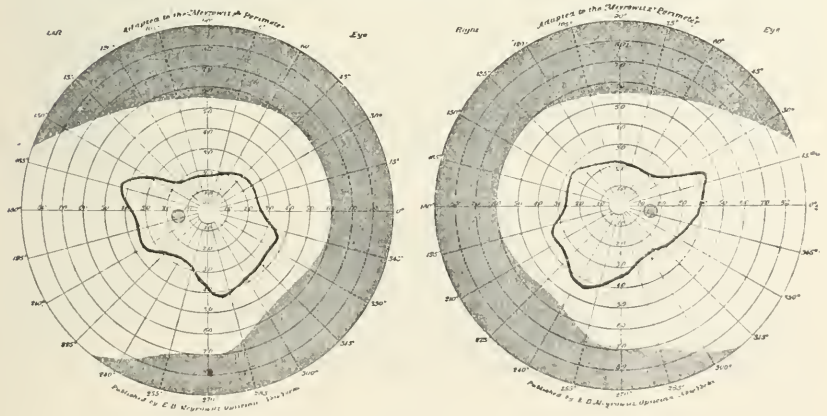
The diagnosis of quinine amaurosis was made. No drugs were given in the treatment of the case. The patient was directed to remain in the recumbent position, and was allowed a liberal diet. A favorable prognosis was given.



Fields of vision two weeks after taking sixty grains of quinine in twelve hours.



Field for red, thirty-six days after taking sixty grains of quinine in twelve hours.



Fields for white, February 5, 1898.

Two weeks later vision had improved so that it was as follows: R. E.=20/100; L. E.=20/80. The fields of vision were taken, and are shown in the accompanying figures.

On February 5, 1898, I found the patient's condition as follows:

V in R. E.=20/120; with+2.50=20/30.

V in L. E.=20/120; with+2.00=20/20.

Reads Jæger 1 at 10 inches, with+6.00 in each eye. Fields for white are shown in accompanying cuts.

While this condition is called quinine amblyopia it may be caused by any of the alkaloids found in the bark, or may result from a large dose of the tincture of the bark. The sulphate and bisulphate are more active than other salts. Owing to the fact that in most of the cases the patients were suffering from general diseases, such as malaria, syphilis, meningitis, pneumonia, typhoid, gastro-enteritis, etc., it has been doubted that the blindness was due to the ingestion of quinine; but, on the other hand, the exact clinical picture of quinine amaurosis can be produced in dogs, and in Giacomini's case a healthy individual took 3 drachms of quinine by mistake, instead of cream of tartar. "Within an hour he felt great pain in the head, stomach-ache, dizziness, general debility, and finally became unconscious. The face was pale; the lips and extremities were livid and cold. The pulse was uniform, slow, hardly perceptible; the respiration sluggish. The pupils were very much dilated. When consciousness returned, sight and hearing had almost entirely vanished. The general prostration and weakness of sight and hearing lasted a long time."* This case occurred in 1845, before the days of ophthalmoscopy.

The dose causing blindness has varied from fifteen grains to an ounce in twenty-four hours; occasionally temporary blindness has appeared after the administration of 15 grains in divided doses in twenty-four hours. Of 69 cases gathered from literature by de Schweinitz† 42 were males, 20 females, and in 7 the sex was not given. The ages varied from 3 to 65. Thirty-four were under 40 years of age. One case is recorded in which a negro became blind from quinine.

The symptoms in quinine-amaurosis are:

1st. Total blindness following the ingestion of large quantities of quinine.

2d. Pallor of optic discs.

3d. Marked contraction of the retinal blood vessels.

4th. Contraction of the visual fields.

The pupils are widely dilated and do not contract on exposure to

* Gruening: Archives of Ophthalmology. Vol. X., p. 82.

† De Schweinitz; Toxic Amblyopias. Philadelphia. 1896.

light; but, according to some observers, they contract to a slight extent on accommodative effort. This was true of my patient.

The prognosis is favorable so far as the restoration of central vision is concerned. In grave cases the visual field is not restored in its entirety. In one instance the patient was practically blind two years after the administration of quinine, vision in the better eye being equal to perception of movements of the hand at six feet. It is probable that other cases equally unfortunate have occurred but have not been reported.

To explain the occurrence of this kind of amaurosis we must look to the vaso-motor system. In dogs poisoned by quinine de Schweinitz found thickening and changes in the walls of the optic nerve vessels (endo-vasculitis), thrombosis of the central artery with organization of the clot, and complete atrophy of the visual tracts.

OCULAR THERAPEUTICS—A REPORT.

BY MELVILLE BLACK, M.D.

DENVER.

Anything new in this line that has established value is already an old remedy. The few agents that I shall recognize I have given personal trial. While I have not as yet been able to thoroughly satisfy myself that they possess all the virtues claimed for them by their advocates, I am convinced that they have merit, and shall continue to give them further trial.

Dr. Sinclair Tousey says, in *The New York Medical Journal*, November 6, 1897, in an article largely devoted to keloid, that thiosinamine, an alkaloidal derivative of the oil of mustard seed, is of value in producing absorption of corneal opacities. His method of administration is to give hypodermically one and a half grains in the triceps muscle every third day until about twenty-seven injections have been given. He claims that it has no deleterious effects upon the human organism. His explanation of how it produces absorption of cicatricial tissue is that it "produces a tremendous cellular activity in the circulating medium, which calls forth a coördinate activity in the leucocytes and fixed connective-tissue cells throughout the organism, and increased removal of effete or lowly organized material by way of the blood and lymph channels. This view is strengthened by recorded observations of diuretic action when beginning its use." For hypodermic injection the drug does not keep well in watery solution. He recommends that it be dissolved in a sterilized

solution of glycerine and water, in the proportion of ten parts of thiosinamine to one hundred parts of the glycerine and water solution.

I have used this remedy in two cases of corneal leucomata. In each case the dense opacity was markedly reduced both in size and density. Sufficient clear cornea was obtained at the corneal margins to warrant an iridectomy with a view to restoring some vision to the eye. It was not deemed prudent to do this in either case because the fellow eye was perfect. I could not see that any annoying systemic symptoms followed its use. I would recommend its trial by others.

An interesting article appeared in the *Cleveland Medical Gazette*, wherein Dr. Thomas H. Pleasants, of Helena, Mont., gives his experience with Doctor Santarnecchi's method of "Hydraulic Curetting of the Cornea." His method of hydraulic curetting is as follows: A syringe, holding about an ounce, is fitted with a fine nozzle, which has about the same caliber as a fine hypodermic needle. The syringe is filled with a 1-1000 solution of bichloride. After instilling several drops of 1 per cent. solution cocaine into the eye, and waiting a sufficient time for its anesthetic effect, he separates the lids as widely as possible, and, directing the jet of sublimate solution against the ulcer or wall of the corneal abscess, gradually increases the force of the stream until the last portion of adherent ulcerated tissue is removed. He reports three cases: one of corneal ulcer with hypopion; one of traumatic infectious ulcer, with extensive corneal infiltration, and lastly a case in which both corneæ have been injured by the lodgment of foreign bodies, resulting in extensive corneal ulceration in the one first involved, with every prospect of the same condition resulting in the one last injured. The hydraulic curetting was repeated every day or every other day according to the indications. The eye is kept bandaged during the interim. He claims that the reaction is slight, and that there is little or no pain. The repair is rapid. Hypopion is soon absorbed. He finds that the results obtained under this treatment exceed those obtained under any other, and advises strongly that it be tried.

I can indorse all that Doctor Pleasants has said in so far as my experience with the procedure will permit. It would seem to be the most natural way of removing infectious necrotic material from an ulcerating surface, and is certainly productive of less traumatism than that obtained by the curette or actual cautery.

Dr. W. H. Bates, in *The New York Medical Journal*, continues to recommend the use of an 80 grain solution of the dried extract of suprarenal capsules, together with cocaine, to produce complete anesthesia, where the

use of cocaine alone will not suffice. He claims to be able to produce complete anesthesia, no matter how much inflamed the eye may be, and to be able to prolong anesthesia indefinitely in protracted operations. Bleeding is almost nil. The suprarenal solution is first used, and after a few instillations the cocaine is used.

Doctor Bates first advocated the use of the suprarenal several years ago, and at that time I gave it a trial. I only used it in one case, which was hardly fair, but the reaction which followed its use was so extreme that I felt afraid of it. The case was one of hypopion-keratitis, with the ocular conjunctiva looking like a piece of raw meat. I used it purely to see what influence it would have upon such an injected membrane. In a very few moments it bleached the ocular conjunctiva to a dirty white, with scarcely a blood vessel to be seen. Its action as a vaso-constrictor was certainly wonderful. As soon as the vessels began to dilate again the patient complained of severe pain in the eye, and it was with difficulty that he controlled himself. This pain lasted about half an hour, when it gradually subsided under the use of hot applications. Within the last year I have been using the suprarenal in occasional cases where it was desirable to have a field of operation free from blood and protracted anesthesia. Here it has proved very satisfactory, and no pain followed its use.

Dr. William Cheatham's paper on Jequirity in the *Journal of the American Medical Association*, January 15, 1898, was interesting, not because he was advocating something new, but because of the indorsement of a grand old remedy that is falling into disuse. No doubt Dr. Cheatham learned to use Jequirity while he was interne in the Manhattan Eye and Ear Hospital. So did I. We evidently learned not to be afraid of it. We learned to use it there in the form of an infusion. It would seem that we have both departed from our early teaching in that the powder dusted into the eye, or rather over the everted lids, is found to be more satisfactory. Jequirity will cure pannus when nothing else will.

Protargol seems to be the latest product of silver to attract our attention. It is really an albuminate of silver in the form of a yellowish powder that is soluble in water. It does not precipitate nor form new combinations with chlorine nor coagulate albumen, hence is supposed to penetrate more deeply into the tissues than silver nitrate. It also has the advantage of being almost entirely non-irritating. Dr. Adolph Alt, of St. Louis, in an article in the *American Journal of Ophthalmology*,

indorses it very highly. He finds it equally as useful as silver nitrate, and to be non-irritating.

I have been using Protargol for about three months, and have not satisfied myself as yet that it is a complete substitute for nitrate of silver. I have been wedded to the latter product for a long time, and am loath to give it up. I must say, however, that protargol seems to be giving good results where I have used it, but in most of my cases which would have put it to test I have used silver because I knew what it would do, and I did not want to take any chances with a remedy still under trial. One case of gonorrhœal ophthalmia that came to me after the cornea had ruptured has responded like magic to a 5 per cent. solution of protargol. In three days' time all purulent discharge had ceased.

PARINAUD'S CONJUNCTIVITIS.

BY FRANK W. MILLER, M.D.

RED OAK, IOWA.

Parinaud's Conjunctivitis: June 28, 1898.—Harry M., farm-boy, age 12 years, says that three days ago was struck in right eye with boxing glove. Lids immediately began to swell, and in twenty-four hours was unable to open them—the glands of the face and neck became swollen, and the eye was discharging freely.

Present condition: L. E., normal; R. E., lids œdematous and red; muco-purulent discharge oozing from between them, and "scalding" cheek. Pre-auricular and cervical glands under angle of jaw swollen, red and exquisitely tender—those in front of ear threatening to suppurate. On separating lids found bulbar conjunctiva moderately injected and cornea normal. On everting lids retro-tarsal folds—especially upper—very much thickened and congested. On tarsus (upper) were four well marked abscesses or pustules, varying from 2 to 5 mm. in diameter, of a greyish-yellow color, very tender, and on incision discharging a drop or two of thin pus. The ulcers that followed were rough and irregularly cut, with considerable of granulation tissue. They healed very kindly. The pustules were separated by a very œdematous and almost granular conjunctiva. On the lower tarsus were two or three similar processes, but smaller. They were not incised; one finally discharged, leaving a small ulcer; the others were absorbed. The lymphatic glands did not suppurate and the infection subsided as the eye improved. In three weeks healing was complete and perfect. The patient incidentally had a very severe attack of tonsillitis.

A NEW TREATMENT FOR TRACHOMA—PRELIMINARY REPORT.

GEORGE F. KEIPER, A.M., M.D.

LAFAYETTE, IND.

Eye and Ear Surgeon to St. Elizabeth Hospital, St. Joseph Orphan Asylum, Indiana State Soldiers' Home, etc.

Illustrated.

The treatment to which I desire to direct the ophthalmic world is that of interstitial electrolysis. Interstitial electrolysis is sometimes called metallic electrolysis. It has been used extensively in other parts of the body in the treatment of diseased conditions, but, so far as I can find out, the application of the principle has never been made to trachoma.

The feature of the treatment in general is to dissolve an electrode made of copper, iron, silver, zinc, etc., in the tissues by the means of the galvanic current, the soluble electrode being at the positive pole of the battery.

The solubility of a pure copper needle may be very easily demonstrated by thrusting it into a piece of lean beef, and after connecting the needle to the positive pole and a dispersing electrode to the negative pole of the battery (applying it to the meat at some distance if possible), turn on the current of electricity. After a time the meat, when cut open, will show an apple-green color. Chemical analysis shows this to be oxychloride of copper, a very powerful germicide. It will also be noted that it is diffused, and not confined to the location of the needle. It will also be noted that the diffusion is toward the negative dispersing electrode. This diffusion is known as cataphoresis.

Again, take an ordinary copper point, such as is shown in figure 2, and put it at the positive pole of the battery; hold it on the surface of the meat and put a dispersing negative electrode close by, and the surface of the meat is discolored green, and the color is diffused into the tissue in the direction of the negative electrode. The chemical reaction is the same as in the first instance. In this process oxygen, hydrochloric acid, and sulphuric acid are formed, which, uniting with the copper, forms the oxychloride of copper. This is in a nascent state. For a fuller account of interstitial electrolysis and cataphoresis I would respectfully refer the

reader to Bigelow's *International System of Electro-Therapeutics*, or Scheppegrell's new work on *Electricity in Diseases of the Nose, Throat and Ear.*

THE NECESSARY EQUIPMENT.

First. A good battery, say of twelve cells. No particular make is recommended, because the number of responsible manufacturers is very large and their wares are first-class.

Second. A milliamperemeter. No current should be passed through an eyelid without being carefully measured. It should be "dead beat," i. e., not influenced magnetically by the presence of steel or iron in its neighborhood. The Weston and Kenelley meters are the best.

Third. Several pure copper electrodes. The ones whose illustrations are submitted below I have found best.

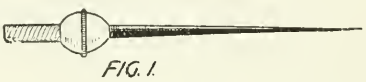


FIG. 1.

FIG. 2.

Figure 1 is tipped with the minutest quantity of silver to facilitate its introduction into the substance of the lid, though the one illustrated by figure 2 is sufficient when applied to the surface of the conjunctiva of the everted lid. The electrodes should be made so that they will fit the universal handles. The dispersing electrode may be the ordinary hand carbon, one usually found with modern batteries.

THE TECHNIQUE.

A four per cent. solution of cocaine is dropped into the eye, and again dropped in in three minutes. After waiting five minutes the lids are sufficiently anesthetized for work. The patient then is given the dispersing electrode connected to the negative pole of the battery, and may either hold it in his hand or may hold it on the back of his neck. The surgeon stands behind the patient, everts the affected lids, and with the blunt-pointed electrode rubs gently the conjunctival surface of the lid. The milliamperemeter should not register over five milliamperes during this procedure. Three milliamperes is generally all that the majority of patients can stand. The seance lasts for five minutes. After treatment patients complain of some smarting and stinging, due, no doubt, to the deposit of the oxychloride of copper within the substance of the lid beyond the reach of the cocaine. The treatment should be repeated twice weekly.

The copper needle may be thrust into each granulation, the current

turned on, observing the same precaution as in the use of the blunt electrode.

The question may now be asked, To what forms and conditions of trachoma is this treatment applicable? To which may be replied: To those forms in which the copper sulphate pencil is usually applicable, and no others.

The cases upon which this form of treatment has been tried have so far progressed favorably, and the hint is thrown out that it may have a universal trial at the hands of all ophthalmologists possible, so that quickly may be determined its true value as a remedial agent in trachoma.

A SATISFACTORY METHOD OF REMOVING POWDER STAINS IN FRESH CASES.*

BY J. W. HEUSTIS, M.D.

DUBUQUE, IA.

Several years ago an operation was brought to my notice for the removal of powder stains or grains of powder imbedded in the skin from recent accident or explosion. From time immemorial it has been the custom of many to attempt the extraction of powder from the skin with a needle or other sharp-pointed instrument. In some cases this procedure has been partially successful, but in most cases a blue stain is left. It is almost impossible to remove the grains of powder intact, and where one is broken a staining of the tissues surrounding it is sure to result, and this discoloration is permanent.

The operation to which I wish to call attention is so simple and effective that when once tried will always be used. The patient must first be thoroughly anesthetized. Then with a stiff nail-brush, and using soap and water rendered antiseptic by carbolic acid, bichloride solution, or any other antiseptic that may please the operator, scrub the part thoroughly. Do not hesitate to draw blood, and do not cease until the grains of powder have been entirely removed and face, hands, or other surface are clean. Should it become necessary to remove the entire cuticle do not hesitate to do so, as it will reform in a few days. It is sometimes impossible to eradicate a deep spot entirely, and in this case a smooth, elliptical incision is to be made, the stain removed, and a light suture inserted. Following the operation of scrubbing, it is only necessary to cut a cover-

*This procedure was recommended to me by my friend Heustis a number of years ago, and it has rendered me such good service, and seems to be so little known, that I have asked him to write it up for the RECORD. H. GIFFORD.

ing the shape of the surface denuded, soak it in carbolized oil and apply. The next day the patient is liable to complain of a stiffness of the skin of the affected parts, which passes away in a short time. After the skin has resumed its normal condition it may be necessary, where blue spots may be seen remaining, to remove by the elliptical incision previously mentioned.

I have performed this scrubbing operation many times and have yet to note its first failure of success, either in my hands or those of my friends to whom I have recommended it and by whom it has been tried.

Treatment of Strabismus.—At the July meeting of the *Paris Academy of Medicine*, Dr. Panas communicated some observations on this subject. He said that the squinting eye was the one which deviated most from the line of vision. Nevertheless strabismus was only apparently unilateral. If the phenomena accompanying this condition were analyzed in detail it would be found that the strabismus was always bilateral, and if it appeared unilateral that was because the patient only used the eye which was least affected, and in overcoming the deviation of this one exaggerated the obliquity of the other. As for therapeutic measures, Dr. Panas held that as the affection was bilateral there must be a bilateral operation. In 230 cases Dr. Panas performed tenotomy of both internal recti, and stretched them in addition, thus lessening their tendency to overaction. Dr. Panas never performs advancement, finding a simple tenotomy sufficient. In 220 cases he had never seen any overcorrection, or if there were a little it was only temporary. Of 220 convergent cases of strabismus, he had 190 in which the result was immediately successful. In those which were unsuccessful the result was not overcorrection but undercorrection. In ten cases Dr. Panas rectified this by advancement of the antagonistic muscles, and in every case with success.—*London Lancet.*

In the *Lancet* of July 2, 1898, Sydney Stephenson reports the results of his experiments with mydrin, which is a combination of ephemdrin hydrochloride and homatropine hydrochlorate. The author has reached the conclusion that it was capable of doing all that had been claimed for it—namely, its capability of causing moderate dilatation of the pupils without involving the function of accommodation. He believes it to be a valuable agent in the hands not only of the ophthalmologist, but also of the physician desirous of examining the fundus oculi with a dilated pupil.

THE

OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, OCTOBER, 1898. NO. 10. NEW SERIES

EDITORIALS.

TO OUR READERS: With a desire to afford the widest discussion of questions in Ophthalmology the OPHTHALMIC RECORD has published leading articles furnishing the views of all schools of thought, it being well understood that the writers are alone responsible for the opinions therein expressed. In the September issue such an article was printed (*Pathology and Surgery vs. Etiology and Therapeutics*) which contains certain statements in regard to pathology and surgery at variance with the beliefs of many experienced ophthalmologists that it now seems necessary to repeat the statement—particularly as the article in question was unsigned—that the staff of this journal is not as a whole, or in any sense, responsible for, or necessarily in accord with this or other leading articles appearing in its editorial pages.

THE APPARENT SIZE OF THE ERECT IMAGE OF THE OPTIC DISK.

Some years ago, in Berry's *Diseases of the Eye*, first edition, 1889, page 573, I found the statement that, taking the distance from the second nodal point to be 15 millimeters, and neglecting any change caused in it by the necessary accommodation, the definition (apparent size of the optic disk) would be about the same as that of a penny (English) held at about ten and eleven inches from the eye. Berry gives the actual diameter of the disk (*post-mortem*) as 1.75 millimeters and the diameter of a penny as 31 millimeters. "The magnification," he says, "is then as 31 to 1.75, or roughly 18 diameters, if we compare the ophthalmoscopic distinctness of the image with that which the naked eye would give of the disk * * * at about 10½ inches from the eye."

A few years later, the excellent text-book of de Schweinitz* contained the following: "The optic disk, which measures about 1.5 millimeters, appears under this method (direct) nearly the size of a 25-cent piece. This, however, is only relative to the distance it is projected." Both authors refer to the examination of an emmetropic eye by an emmetropic eye.

These comparisons were to me somewhat startling, as I had never seen an optic disk that appeared to me anywhere near the size of an English penny or an American 25-cent piece. I have since then attempted many times by mental effort, or change of "distance of projection" even to "infinity," to convey to my consciousness an image ranging from 23 to 31 millimeters in diameter, but it has been impossible. Under emmetropic conditions of both myself and patient, my consciousness gives me an image of about 13 millimeters in diameter, and this size varies but little, whether I adjust my "projection" for 25 centimeters (10 inches) or for "infinity."

I know very well that in the dissected eye the optic disk measures from 1.5 to 1.75 millimeters in diameter. I am also familiar with the mathematical formulæ by which the magnification of the erect image is determined. Mathematically considered, it is true that this image should appear to the observer with good accommodation, his vision being adjusted for a distance of 20 centimeters (7 inches) to 30 centimeters (12 inches), from thirteen to twenty times as large as the disk itself, or as having a diameter of 20 to 30 millimeters. Without accommodation or for an adjustment to a greater distance than 20 to 30 centimeters, it would appear proportionately larger. †Zander gives the magnification as 14⅓ diameters, with a visual projection of 8 inches; ‡Loring, 14⅓ diameters, with the same projection; Landolt, "an enlargement equal to 20 millimeters" (13⅓ diameters) with projection at 30 centimeters; §de Wecker and Masselon, "17 to 20 times," projection 25 to 30 centimeters; ¶Fuchs, 14 diameters; **Panas, 20 diameters; ††Fick, 17 diameters; ‡‡Tscherning, about 13 diameters; projection, 20 centimeters. Thus it will be seen that the comparisons drawn by Berry and de Schweinitz are confirmed. But does consciousness really picture an image of any such size?

*_Diseases of the Eye_, first edition, 1892, page 99.
†_The Ophthalmoscope_, by Carter, 1866, p. 86.
‡_Text-Book of Ophthalmoscopy_, 1886, vol. I, p. 142.
§de Wecker and Landolt's _Traité Complet d'Ophtalmologie_, 1889, Tome I, p. 815.
§_Manuel d'Ophtalmologie_, 1889, p. 960.
¶_Text-Book of Ophthalmology_, by Duane, 1892, p. 7.
**_Traité des Maladies des Yeux_, 1894, Tome I, p. 184.
††_Diseases of the Eye and Ophthalmoscopy_, by Hale, 1897, p. 108.
‡‡_Optique Physiologique_, 1898, p. 178.

As already stated, I have never been able to perceive one larger than 13, perhaps 14 millimeters, in diameter, with *any adjustment* of my vision. I have interrogated others, and they tell me that such is their own experience. I have measured drawings made of the erect image by many authors, and I find the diameters of their optic disks to range from 13 to 16 millimeters. Some are drawn a little larger.

These "psychological" measurements are so much at variance with those determined by mathematical calculations, that I am led to express my doubt as to the erect image ever appearing to anybody, under emmetropic conditions, as being the size of an English penny, (about that of our 50-cent piece) or of a 25-cent piece. It is more nearly that of the old style, silver 3-cent piece. A. A. H.

THE EDUCATION OF THE OPHTHALMOLOGIST.

In spite of important advances in medical education during the past decade, comparatively little has been said, done or written toward guiding the medical student to a due preparation for following any particular branch of medical science, or, in familiar parlance, helping him "to take up a speciality." Well-balanced medical men disparage the tendency to specialism; they see in it a drift toward narrowness, superficiality and ignorant exaggeration, and insist, with reason, that the best preparation for following a specialty is a thorough education, supplemented by ten years or more of general practice.

It needs no argument to demonstrate the value of such preparation in the recognition and successful treatment of maladies of the eyes, so many of which are the result of systemic disease. But with these all analogies end, and there remains a very large portion of the field of ophthalmology which is peculiar to itself, and which must be studied for itself, *not* after years of general practice when habits of thought and life have been formed and technical knowledge is with difficulty acquired, but during young student life. Ophthalmology is peculiar to itself in respect to the study of ocular physiology and dioptrics, light and color perception, binocular vision, opthalmoscopy, skiascopy, keratometry, perimetry, etc., and no amount of experience in other departments of medicine is of the slightest assistance in understanding them. The proper detection of errors of refraction alone requires the highest technical skill, and constitutes about three-fourths of the oculist's labor, and it is precisely with respect to refraction and binocular vision that the average oculist is found wanting *practically*.

Now, it is manifest that a substantial advantage in regard to these branches accrues to the medical student who, with intent to become an ophthalmologist, thoroughly grounds himself theoretically and practically in them.

Heretofore ophthalmology in America has been recruited in the majority of instances in the person of physicians who have taken it up as an after thought; stumbled into it with little or no specific preparation, to say nothing of a lack of university training, and their incompetence has been in proportion. Many attempt to patch up their deficiences by taking a course in some post-graduate or rapid-firing "ophthalmic college," but the foundation is wanting and the superstructure remains imperfect. To give the student an adequate foundation requires a radical departure from present methods. Neither theoretical nor clinical instruction in refraction and accommodation, and their anomalies can, for instance, be adequately taught in didactic lectures or by text-books, or in our clinics as usually conducted. The theoretical instruction should, it is believed, be carried out by dividing the classes into sections and requiring blackboard demonstrations exactly as in the case of mathematics, with such works as those of Donders and Landolt as guides, together with practical work in a well equipped ophthalmological or physiological laboratory in accordance with modern university methods.

With a groundwork of physiology, chemistry, physics and mathematics those branches of ophthalmology peculiar to itself can be mastered in a university preliminary medical course and the time spent in a medical college actually shortened.

It would be an advantage to all medical students, and to the prospective ophthamologist indispensable. F. B. E.

SOME ASPECTS OF THE TRACHOMA QUESTION.

For one who has lived long in a trachoma-infested region with a mixed population it is hard to repress a smile at the attempts to account for the occurrence of the disease by the shape of the head or the race-ancestry of the individual. He finds trachoma distributed impartially among long-headed Swedes, round-headed Bohemians, Irish Celts and North German Teutons; and while with all nationalities it is much more common among the lower classes, the fact that dirt alone cannot account for it is shown by its invading the sacred precincts of the "best families" when any one of them is unfortunate enough to get a nurse girl with an

inconspicuous form of the disease. The case of the African needs special consideration, for there seems to be no question of the accuracy of Burnett's observation that the American negro is almost entirely free from it. But in view of the fact that when the negro mixes more freely with other races, as in Egypt, Turkey and Brazil, he contracts trachoma with facility, it seems reasonable to accept the explanation of Pitts that the apparent immunity of the race in this country is largely due to its isolation. The ancestors of our slaves came almost entirely from the west coast and the interior of Africa, where the absence of trachoma can perhaps be accounted for, to some extent, by the low estimate in which the ordinary vehicles of contagion, clothing, towels and washing utensils, are held.

Regarding the germ of trachoma we unfortunately know no more than ever. Aspirants for the distinction of discovering it are plenty but each one finds a different germ. In spite of this, the clinical evidence is such that it is hard to believe that there are any who really disbelieve in the specific, contagious nature of trachoma. For any such, the personal experience of the writer may be of interest. On the sixth or seventh day after getting a drop of blood from a trachomatous lid into his left eye a typical trachoma developed which it took two years of constant treatment to cure; vision at one time being reduced to 20/70. Equally convincing is the case of the writer's office boy who, through a mistake, was inoculated with the discharge from an acute trachoma. On the seventh day thereafter he developed the same disease in a perfectly characteristic form.

Cases of monocular trachoma are sometimes cited as evidence against the contagiousness of the affection. To dismiss these with the assertion that they require no more explanation than the one-sided cases of gonorrhoeal conjunctivitis is hardly fair, for gonorrhoea of the conjunctiva is seldom contagious for more than a week or so and hence gives nothing like the chance for infection of the second eye which is afforded by a chronic trachoma. These cases may generally be explained in one of two ways: either the patient has taken particular pains to avoid infecting the second eye, and that such pains may be effectual the writer knows from experience with his own and a number of other cases, or the disease was really binocular at one time, but for some reason has run a light and rapid course in one eye, persisting in the other. These rapid spontaneous cures are not common, but they certainly do occur at times, in one or both eyes. With the exception of the cases in which the disease has been observed from the start and has purposely been kept from the second eye,

the writer has yet to see an old case of monocular trachoma in which either a history or distinct traces of previous disease could not be made out.*

The view of Fuchs that trachoma may result from gonorrhoeal infection is probably due from his having happened to see some of the cases where persons with latent trachoma having become infected with gonorrhoea present themselves with the original disease entirely masked by the new infection and as the former continues after the subsidence of the latter, the trachoma is thought to be a sequel of the gonorrhoea. The writer has seen at least one such case where, if the previous condition had not been known, such a conclusion would have seemed warranted. In this case the trachoma, far from being extinguished by the gonorrhoea, continued on its course in a worse form than ever.

With regard to the diagnosis of trachoma, as a rule, the acute and sub-acute cases are the only ones which present any difficulty; and while genuine trachoma seldom fails to be recognized, opportunities frequently offer for the opposite mistake, that of designating as trachoma something much more innocent. Without considering the frequent diagnosis of trachoma by the inexperienced, in cases of conjunctival hyperæmia and follicular catarrh, there are not infrequent cases of conjunctivitis caused by the pneumococcus and by the diplo-bacillus of Morax which clinically so closely resemble trachoma that a mistake is almost unavoidable, unless the discharge is examined microscopically. Where, in doubtful cases, the microscope has shown pneumococci or diplo-bacilli in any considerable number, the writer has never been disappointed in excluding trachoma; while if the discharge shows nothing or only a few staphylococci or xerosis bacilli the suspicion of trachoma is increased. The most difficult cases of all are those chronic cases characterized by an abundant development of follicles in the folds, with unaffected tarsi and a very slight reaction. In some of these, until the trachoma germ shall have been discovered, a certain diagnosis is impossible. The writer has seen about a dozen such cases in which neither the clinical picture, the microscopical examination, nor the course of the affection has made him feel sure whether the disease were really trachoma or extreme follicular conjunctivitis; but as the best treatment is expression in either case the patient need not suffer on account of the uncertain diagnosis.

H. G.

*This explanation naturally rests in the assumption that a mild attack of trachoma guards against subsequent infection. To this proposition may be opposed the fact that, in relapses, trachoma often reappears in tissue from which it has in all probability been once entirely eradicated: but it is entirely possible that while the constant exposure to the germs and toxins from the still diseased parts of the membrane might break down any immunity acquired by other parts of the same sac, the same degree of immunity might be effectual in preventing the few germs, which at any one time would be conveyed to the second eye, from gaining a foot-hold there.

REPORTS OF SOCIETIES.

SECTION ON OPHTHALMOLOGY.

BRITISH MEDICAL ASSOCIATION, JULY, 1898.*

After the president (Dr. Argyll Robertson) had opened the section on ophthalmology, Professor Nuel (Liége) read a paper on the "Absorption of Aqueous Humor by the Iris." He pointed out by the aid of diagrams the presence of lymphatic channels in the iris of the dog and cat. Indian ink was injected into the vitreous of the eyes of these animals and the passage of the ink traced into canals in the iris. By staining with silver nitrate he had found canals and stomata, the canals increasing in size towards the ligamentum pectinatum. He applied the results of these experiments to the causation of glaucoma, and pointed out that iridectomy opened up the canals. Mydriatics also had the same effect, thus increasing the flow from the eye. Professor Nuel then showed lantern slides illustrative of his paper. Doctor Berry (Edinburgh) made some remarks on the result of the injection of chlorine water into the vitreous in septic cases. Professor Nuel, in reply, stated that absorption took place from the anterior surface of the iris, and this was the principal area of absorption in the eye. Doctor Reid (Glasgow) next showed some lantern specimens illustrative of reparative processes following wounds of the cornea, and specimens of intercalary cells met with in the cornea. Dr. George MacKay and Dr. J. C. Dunlop (Edinburgh) then read a paper on a "Case of Acquired Color Blindness," which came on suddenly in a patient suffering from cancer of the stomach. The patient's vision was good, media clear, refraction emmetropic, fields of vision good to hand movements, but restricted to more accurate measurement. Five months after the color blindness came on the patient died. The *post-mortem* examination revealed cancer of the pylorus and atrophy of the posterior end of the occipito-temporal convolution of the right occipital lobe, with general shrinkage of the right occipital lobe. On section the left occipital lobe was found slightly affected and the arteries and capillaries extremely thickened. Lantern specimens of the brain and arteries were

**British Medical Journal*, July 30, Aug. 6, 1898.

then shown. Doctor Berry (Edinburgh) spoke on the difficulty of proving the existence of a color center apart from a center of form, the form sense and the color sense being closely associated. Dr. McKenzie Davidson (London) gave a demonstration on the employment of the Roentgen rays in ophthalmology. He had used them in forty-one cases of foreign body in the orbit with satisfactory results. He showed the apparatus he used, and gave a demonstration of his methods on a patient. His principle was based on getting three coördinates of a point; the three planes were formed by two knitting needles fixed on the apparatus, one vertical, the other horizontal, crossing one another, and by the photographic plate. The patient's head was fixed, the axis of his eye being parallel to the horizontal needle. A fine Crookes tube was used in two positions, 6 cm. apart, and the two plates thus obtained being afterwards placed in stereoscopic relief. A piece of lead wire was previously placed on the patient's lower lid to form a known point from which the position of the foreign body could be calculated. This was worked out by means of a separate apparatus. A number of lantern slides illustrative of the apparatus and of skiagraphs were then shown. Mr. Treacher Collins (London) showed a number of lantern slides illustrative of foreign bodies in the eye, which had been localized by Dr. McKenzie Davidson by skiagraphy, and afterwards successfully removed. He advocated the early use of the rays in all cases of suspected foreign bodies in the eye. Doctor Cargill (London) mentioned five cases in which Dr. McKenzie Davidson's method had proved of great value in deciding the presence, situation, or absence of foreign bodies. Doctor Reeve (Toronto) showed an apparatus made by Doctor Sweets (Philadelphia), and Professor McHardy (London) spoke of two cases in which skiagraphy had proved most important. Doctor Hinshelwood (Glasgow) read a paper on "Holocain," and advocated its use as an anesthetic in eye work; it acted more rapidly than cocain. Mr. Edgar Browne (Liverpool) said that he used it in all superficial operations, as it had no harmful action on the cornea. Dr. Argyll Robertson said his experience led him to consider that holocain was much inferior to cocain, but Doctor Hinshelwood said that he believed that most cases of failure were due to imperfectly prepared solutions. Dr. Leslie Buchanan (Glasgow) then showed some specimens of leuco-sarcoma of the choroid. Professor Snellen (Utrecht) gave a "Historical Review of Operative Treatment of Strabismus," from the first operation by Professor Dieffenbach in 1839 onwards. He compared the operations of von Græfe and of Priestly Smith, and described the operation he himself had adopted. He emphasized the importance of

producing as little injury to surrounding tissues as possible, thus preventing subsequent cicatrisation and shortening of the muscle. He advocated removal of a portion of the tendon in many cases. Chloroform should not be used, but a local anesthetic, as cocain. A discussion ensued, in the course of which Doctor Little said that he did not fully correct the squint at the time of operation. At the same time he laid stress upon the importance of the use of glasses, especially in young children. Doctor Berry said he believed that cases of insufficiency after tenotomy were due to too free divisions to a less extent the following cicatricial contraction might be a cause. Dr. Argyll Robertson drew attention to Mr. Critchett's operation in cases where divergence had resulted from previous operation. Professor Snellen replied, advocating the use of glasses, and the undesirability of any operation in very young children. Mr. Lawford read a paper on the "Operative Procedure for Cases of Incarcerated Iris." This consisted in passing a Græfe's knife through the margin of the cornea into the anterior chamber and out at the opposite side. He then divided the iris on each side of the adhesion. Dr. Argyll Robertson preferred operating twice. Professor Snellen said he considered the principal object of operating was to reduce tension. He performed sphincterotomy instead of iridectomy. Doctor Berry though that in the majority the tension was not increased. He did an iridectomy opposite the scar, or a double iridectomy on each side of the adhesion. Doctor Little performed iridectomy as for glaucoma in all bad cases. Mr. Lawford, in reply, expressed the opinion that the reduction of intraocular tension was the most important point. Mr. R. Williams then read a paper on a case of "Paralysis of Accommodation After Influenza." Each eye was affected, the left first. Dr. Argyll Robertson said he had seen two similar cases which followed influenza, but he could not say that influenza had been the cause. Mr. Juler mentioned cases of paralysis of the third nerve after influenza with complete recovery, and Dr. George Mackay several cases of unilateral paralysis of accommodation after influenza. One case was very persistent, but was temporarily relieved by eserin. Mr. Edgar Browne said that paralysis of the third nerve after influenza was less rare than paralysis of the sixth and the optic nerve. Mr. Granger spoke of a patient who had not recovered from the paralysis. Dr. Tatham Thompson read a paper on a case of "Cyst of the Hyaline Canal Producing a Double Lens," and Dr. Angus McGillivray read a paper on the "Hyaloid Canal and its Relation to Cyclitic Exudation." A paper on the "Diplo-bacillus and the Conjunctivitis it Caused" was read by Dr. J. W. Eyre, and on the "Bacteriology of the

Normal Conjunctival Sac and its Bearing on the Use of Antiseptics" by Mr. Arnold Lawson. He found many sacs free from organisms; out of 159 cases, 118 contained the bacillus xerosis. The pyogenic cocci were few, and when injected into the conjunctival sacs of guinea pigs produced no reaction. He advocated asepsis. Doctor Eyre considered that the upper portion of the conjunctival sac was sterile, the lower not so. Mr. Juler (London) read a paper on a case of "Symmetrical Gumma of the Ciliary Body with Recovery of Vision," and reviewed the literature, pointing out the rarity of intraocular syphiloma. Dr. Argyll Robertson said he had seen a number of cases in which the astigmatism produced had subsequently almost entirely disappeared, and Mr. Hill Griffith said he had seen vision entirely destroyed in several cases. Mr. Juler read the second part of his paper on a "Case of Interstitial Keratitis with Acquired Syphilis." Doctor Hinshelwood and Mr. Lawson mentioned similar cases, and Dr. Argyll Robertson said he thought a distinction should be drawn between the characteristic cases of interstitial keratitis and cases of keratitis punctata. He considered that Mr. Juler's case belonged to the latter category. Papers were also read by Mr. J. Fallows, Mr. H. E. Jones, Mr. Charles Wray, Mr. John Griffith (London) and Dr. Adolph Bronner (Bradford). Doctor McGillivray said that in America a solution of extract of suprarenal capsule had been used with cocain to prolong anesthesia. He had tried it in one case with good results. Doctor Reeve (Toronto) said that suprarenal extract acted as a styptic as well, and rendered the operation a bloodless one.

According to Dr. A. Darrier, continued experiments have confirmed the observations made previously, that protargol is entirely without caustic or corrosive action, and that no danger need be apprehended from the use of too concentrated solutions. Instillations of protargol-solutions are scarcely felt, and at the most, only a slight burning is felt a few minutes after application, which is readily borne even by the most sensitive of children. Even the slight pain felt may be entirely neutralized by combining with the remedy an anesthetic. For instillations the author uses a 5 per cent. solution; as a paint, a 20 to 50 per cent. solution is used. Neisser also has called special attention to the very slight irritating effects of protargol, in consequence of which a more prolonged therapeutic effect may be readily obtained by means of it than is possible with other silver salts. The penetrative power seems also to be much greater than with other silver preparations.

REVIEW.

Concerning the Occurrence of Micro-Organisms Resembling Diphtheria Bacilli (Xerosis Bacilli, Segmented Bacilli en Massue, etc.), in the Human Conjunctival Sac, Especially the Normal Conjunctiva, Together with a Contribution Regarding the Early Diagnosis of Diphtheria. By Dr. Hans Heinersdorff. *Archiv für Ophthalmologie*, Vol. XLVI, Part 1.—The current number of the *Archives* contains an interesting paper by Professor Schoeler's assistant, the intention of which is well explained by its title. The author insists that a sufficient bacteriological knowledge of the conjunctiva is essential before any great advances can be made in its pathology, and before any sound conclusions can be drawn concerning certain micro-organisms and their relations to existing disease. Although the literature is very large, positive and well recognized results have not yet been attained. While on one hand many workers consider the conjunctiva as always being more or less the subject of infection, Gelpke and his followers believe it to be nearly or quite sterile. It is therefore not surprising that a lack of agreement exists regarding the organisms usually found in the conjunctival sac, and that the opinions regarding the presence of the Xerosis Bacillus and its allied forms upon the sound or the diseased conjunctiva should be so different. Kuschbert, Neisser and Leber described morphologically and culturally a bacillus which had been noticed in the epithelial cells of Keratomalacia and Xerosis which they then considered as the cause of Xerosis conjunctivæ. In 1883 Schleich and Sattler brought up the question of its pathogeny at the Heidelberg Congress, insomuch as this bacillus has been noticed upon both the sound conjunctiva and during slight inflammations of the same; and although it had been found pretty regularly from time to time in certain mild forms of conjunctivitis, and was supposed to bear some causal relation to them, it was not till 1890 that Baumgarten stated that he considered the Xerosis bacillus, so-called, as nothing more than a harmless parasite in the conjunctival secretion. A few years ago Deyl described bacilli, which he supposed to cause the Chalazion, but which bore a striking resemblance to the Xerosis bacillus both morphologically and by their behaviour in cultures, and lately Gelpke has described a segmented bacillus, which, however, has not been identified as the

Xerosis bacillus beyond all doubt. Eyre considers the Xerosis bacillus as a debilitated diphtheria bacillus, but has never seen it on the sound conjunctiva, and Peters thinks that it may be of significance in slight pseudo-membrane formation. Different observers have noticed this bacillus not only in the Xerotic processes but in other conjunctival diseases and on the sound conjunctiva. The clubbed contamination of Weeks' cultures closely resembles it, and Koch, who with Kartulis studied an epidemic raging in Egypt, described a bacillus which was very similar to it, but possessed some differences, and which is now known as the Koch-Weeks bacillus.

Gayet examined the conjunctival sac of 213 cataract patients, in which he found that 80 contained micro-organisms, mostly cocci, but few bacilli. Schmidt found in the trachoma secretion a form resembling the subtilis, and also a short thick rod with swollen ends. Cazalis described a bacillus *en massue*, which he found during his trachoma investigations growing upon blood serum, and which looked like the Xerosis bacillus. Axenfeld found it frequently associated with the Pneumococci and Diplobacilli, and often found it in Phlyctenular conjunctivitis, and considers it merely a harmless parasite present in over half of sound eyes. Conclusions to be drawn from data hitherto obtainable as regards the presence of the Xerosis bacillus upon the healthy conjunctiva, Fick's recent work on the subject being alone excepted, are unsatisfactory. Gifford did not notice any organisms resembling it in 25 normal conjunctival sacks. Weeks does not mention finding anything like it in the tears of 120 children and 357 cataract patients. Franke examined 130 conjunctivæ, of which 115 were normal, and found 32 germ free, and only one which contained the Xerosis bacillus. Gombert, Axenfeld and others have not found it in normal cases. On the other hand, Schauz and others considered it an ordinary dweller upon the normal conjunctiva; consequently in view of this diversity of opinion the author undertook to determine whether the normal sac was germ free as stated by Gelpke, and whether his Bacillus septatus was really the cause of acute contagious conjunctivitis, and never found in the healthy sac.

Fifty-one persons were examined, and blood serum was exceptionally used. In differentiating those bacilli, which resemble the genuine diphtheria bacillus, attention must be paid to the following points: The changing size of the rods, swelling of the ends, end staining, tendency to segmentation, club formation, rosette-like groupings, frequent negative results or tardy growth on gelatine at the temperature of the room, non-liquefaction, formation of pap-like or finely granular deposit in the other-

wise clear bouillon, not too luxuriant a growth on blood serum, less on agar in slightly prominent colonies, non-pathogenic to guinea pigs. In this class, besides the Xerosis bacillus, is included also the Bacillus duplex, Luftstäbchen, Bacillus septatus, the Bacillus granulosum of Lachowicz, the Chalzion bacillus of Deyl, and the Bacillus *en massue* of the French, all of which bear the title Pseudo-diphtheritic bacillus. This term might create some confusion, since by it is generally understood Hofmann's Pseudo-diphtheritic bacillus of the throat, which, however, is not identical with the often, so-called, Pseudo-diphtheritic bacillus of the conjunctiva. Fränkel finds many differences between it and the conjunctival form, i. e., the Xerosis bacillus. Hofmann's variety grows upon better glycerine-agar than even the genuine diphtheria or the Xerosis bacillus, and it thrives preferably upon gelatine upon which the Xerosis does not grow so well, and it is rarely found upon the conjunctiva. Therefore these pseudo-bacilli of the conjunctiva may in a general way be divided into two great classes: One, the more widely distributed and almost constantly found on the normal conjunctiva, and which does not thrive upon gelatine and potato; the other, less common, which grows more luxuriantly, and which stands more closely to Hofmann's. Of the fifty-one persons examined the tubes were sterile in only two instances, which, however, only goes to prove that the tears used for inoculation contained no micro-organisms; cocci, usually the albus, were the more prevalent, and they were not pathogenic. The typical Xerosis bacillus was found forty-one times, and only three times were other rods found. In 10 normal conjunctivæ examined by Axenfeld Xerosis bacilli were found every time, and in 364 cases varying in severity Uhthoff and Axenfeld found the Xerosis bacillus 88 times. A closely related bacillus has been found in ophthalmia neonatorum. The Xerosis bacillus has not been found early in corneal processes due to Pneumococci or Diplobacilli on account of the more luxuriant growth of the latter, and to meet this condition the medium selected must be more favorable to the Xerosis. The author therefore believes that the Xerosis bacillus represents a group resembling the Diphtheria bacillus, and as a harmless parasite is constantly present in the normal conjunctival sac and in a variety of conjunctival diseases; he also believes it to be constantly present in the Koch-Weeks conjunctivitis. Gelpke, on the contrary, considers most conjunctivæ as being in an abnormal state, and that the results may have been obtained through unusual activity of the inoculating material or the peculiar nature or the culture medium.

Most of the investigators have used Bouillon-peptone agar or glycerine

agar as being the best suited for the work, and Gelpke, especially, in his investigations regarding acute contagious conjunctivitis, and upon the normal conjunctiva, although at first he did use blood serum. Fränkel and Franke prefer the agar preparation, while Baumgarten, Axenfeld and Morax favor blood serum. Upon comparing the growths upon these media it was found that the Xerosis bacillus as a rule grew rather better on blood serum, although negative results might in some cases be ascribed to tardy growth. While upon blood serum the colonies presented the usual appearances after twenty-four hours, the glycerine agar grown bacilli were scanty short rods, appearing like cocci, and well calculated to deceive, but when these were carried over to blood serum the rods lengthened out, presenting a clubbed and segmented appearance; the plasma spaces of Gelpke were likewise noticed. As opposed to Fränkel and Franke, who observed the segmentation and club formation principally upon agar, and who considered it merely a degeneration, the author finds that, when blood serum is used, there are even greater variations morphologically, and he therefore considers the results of his observations as agreeing with Gelpke's description of the Bacillus septatus. If Fick and Leber, who did not use pure cultures, and Monti, who described something else, and Neisser, whose bacillus had some distinguishing characteristics, are ruled out, the descriptions of the other investigators are essentially in harmony, the morphological differences being due to the kind of media employed. At all events there seems to be no good reason for ascribing especial morphological peculiarities to the Bacillus septatus and the giving of a new name to an old acquaintance. The author therefore concludes that the Xerosis bacillus is constantly present in acute contagious conjunctivitis, which it does not cause, and that the Deyl Chalazion bacillus is nothing else than a variety of the Xerosis bacillus, and simply a harmless parasite of the conjunctiva. Genuine Lœffler bacilli have been found present in large numbers in croupous conjunctivitis, and likewise a non-virulent form, the Xerosis bacillus. True diphtheritic bacilli have been found associated with mild attacks of conjunctivitis, and even in the normal sac, and they have been found, still retaining active properties, upon a conjunctiva, which, after passing through an attack of diphtheria, has become sound again. In other instances have been found bacilli after the disease had run its course, which, although morphologically and culturally resemble the genuine, now are non-virulent. This has practical bearing as regards when to apply constitutional treatment and serum therapy for a local condition which may result fatally by the local process becoming constitutional and general. As is well known experts do not

agree upon the question of identity. There are many who regard the Xerosis bacillus as a degenerate or non-virulent diphtheria bacillus, others consider them as identical, but with different degrees of virulence. Spronk has quite recently stated that he thought that he could detect a difference in that he got no effect in guinea pigs with genuine diphtheria bacilli after a preliminary serum treatment, while, on the other hand, after using the Xerosis bacillus under similar conditions, he thought he noticed a localized swelling at the point of inoculation. The majority of observers unite in believing that the differences noticed morphologically and in the culture tube are too slight and uncertain to offer a basis for therapeutics. Again, their behaviour towards weak alkaline bouillon was thought to offer a means for differentiation, the genuine bacilli causing the reaction to become acid after two or three days, while the Xerosis bacillus increased the alkalinity, still Fränkel and others combat this, and claim to have observed an acid reaction with non-virulent bacilli. The only absolute proof is the positive knowledge obtained by inoculation experiments on animals. Recently Neisser has announced a ready method of differentiation of the genuine from the pseudo-bacillus based upon their behaviour toward stains. He makes use of a double stain of Methylen blue and Bismark brown, and obtains delicately colored rods, long and slender, which have a granule at either end, and sometimes another in the middle. Very characteristic are the obtuse angled bacilli, with their two or three granules slightly oval, and if at the ends of the rod seem to make the diameter greater than a cross section of the bacillus. To compare the behaviour of similarly aged Diphtheria and Xerosis bacilli the author undertook a series of experiments, and finds it rather difficult to decide between the two by means of stains. He, however, offers the following: If the double stain shows the typical rod and granule in cultures from nine to ten hours old, they may be considered as virulent diphtheria bacilli. No granule formation is noticed in Xerosis bacilli of the same age, but after twenty-four hours granules may appear, without, however, the typical relation or appearance of the granule to the rod. This refers in general to fresh cultures. As the age of the culture influences the result it is well to stain and examine not later than sixteen hours, for after that an occasional Xerosis bacillus is noticed. Use serum in all cases giving a successful stain. The difficulty of the method must not be lost sight of, and it is well to bear in mind that the success to the stain stands in close relation to the energy of the growth of the bacillus, and this again depends upon the quality of the culture medium. A very complete bibliography and some excellent plates accompany the monograph.

WM. DUDLEY HALL.

The Etiology and Educative Treatment of Convergent Strabismus. By Priestley Smith, M.R.C.S., *British Med. Journal, July 2, 1898.*—For the cure of strabismus measures of three kinds are employed at the present day—optical, operative, and what may be called educative, the aim of the latter being to lead the patient not merely to direct his eyes, but to use them in the normal way. Concerning the value of glasses and operation we are all practically agreed. The educative treatment, that is, the systematic use of the monocular shade, the reading bar, the stereoscope, and so forth, stands on a different footing. Javal,[1] who has been its chief exponent for many years, and has elaborated it with infinite ingenuity, declares that it is not only an important auxiliary before and after operation, but is capable by itself of curing certain cases. Many others have used it to a certain extent, but there is no general agreement as to its value; indeed, one well-known writer goes so far as to doubt whether the cases which have been cured by it would not have got well without it, and whether those which are incurable without it are ever curable with it. The present investigation was undertaken in order to ascertain the value of this line of treatment, and to test the principles on which it is based.

Method of Investigation.—Since January 1, 1897, all cases of concomitant convergent strabismus coming under my care were examined on a uniform system, and noted on special printed forms. The following points were noted, so far as possible: Age; onset age; circumstances of onset; nature of squint, whether periodic or continuous, and whether alternating or monolateral; angle of squint; fixation power of squinting eye, whether true or false; refraction under atropine; acuteness of vision with corrected refraction. So far the methods of examination need not be described in detail. Beyond this there were certain tests, employed chiefly in the later stages, which require explanation.

Potential Fusion.—The squinter, looking at an object such as a lighted candle, sees it single rather than double, because he has learned to take no notice of the image formed in the squinting eye. Will he be able to perceive both images simultaneously and to fuse them if we succeed in putting his eyes approximately straight? The only way in which we can test the point beforehand is by taking two similar objects, and placing them so that while the straight eye fixes the one, the squinting eye fixes the other, and so that each eye can only see its own object, as in the stereoscope. The small instrument which for convenience I will call the "fusion tubes,"[2] is essentially a miniature stereoscope, admitting of free adjustment for abnormal positions of the eyes. Looking through the

tubes as through an opera glass, I see with each eye a white hole and a coloured hole, the colour being red for the one eye, green for the other. Placing the tubes in a parallel position I see the two white holes as one, for the two images are fused. Now the squinter who at first sees four holes—two white, one red, and one green—and then by converging the tubes blends the two whites while he continues to see the red and the green, has, we may assume, a potential faculty of fusion, although under ordinary circumstances he is unable to exercise it, and does not perceive the two images of one object.

Fusion Limits.—Assuming that the patient is able to fuse the two images when the tubes stand at a certain angle of convergence, can he vary that angle and still fuse them? Can he voluntarily abduct or adduct his eyes in the interest of binocular vision, and if so within what limits? For the purpose of accurate measurement I have placed the tubes in a frame which supplies fixed points of rotation, with scales showing their angular movement. The white holes, moreover, are replaced by vertical slits, so that fusion may still be attainable even though the deviation of the eye be vertical as well as horizontal. Fusion having been obtained, we move one or other tube slowly inwards and outwards, and note the point in each direction at which fusion ceases and the lines become double. For want of a better name I have called the instrument a "heteroscope"[3]—an instrument with which a deviating eye sees.

Angle of Equilibrium.—In certain cases which appear to be nearly or completely cured we want to know the position which the eyes tend to assume when the stimulus of fusion is withdrawn. Turning an internal shutter in each tube of the heteroscope, we cut off the upper part of one slit, the lower part of the other. Fusion of the slits is now no longer possible. We tell the patient to place the tubes so that the one white line stands vertically over the other, and thus ascertain his angle of equilibrium.

Actual Fusion: Binocular Vision of a Single Object.—A completely satisfactory test of this point is difficult to find, and the more so because binocular vision is a faculty which presents various degrees of perfection. I adopted as the initial test for actual fusion the principle of Snellen's coloured glasses and coloured letters: Spectacles carrying red and blue glasses in a reversible frame are placed on the patient's face in front of his own glasses. Cards bearing red, white and blue discs and letters on a black ground are shown to him. He must count the discs or read the letters, special precautions as to light and other matters being taken to avoid fallacy. The patient who has recovered the power of fusion will

see the whole, while he who uses one eye and suppresses the vision of the other will see only those discs or letters corresponding in colour to the glass through which the good eye looks.

For the sense of perspective—the higher development of binocular vision which is learned by the continued practice of fusion—I used Hering's drop test.[4]

Etiology and Course of the Disorder.—*The Early Age of Onset* is the most conspicuous fact in the etiology of convergent strabismus. (Table I,) I do not attach a precise value to the figures here given, but I

Table I.—*261 Cases of Convergent Strabismus. Onset Age in General and in relation to True and False Fixation.*

Age: years	0	1	2	3	4	5	6	7	8	9	10	11	12 and over.	Totals.
All cases	16	31	38	63	35	36	9	11	8	6	2	1	5	261
True fixation	13	17	26	50	27	31	8	11	8	6	2	1	5	205
False fixation	3	14	12	13	8	5	1	—	—	—	—	—	—	56

lay stress on the fact that the disorder commonly begins at a time of life when the visual apparatus has not reached completion in structure or function. The development of the visual powers in infancy demands especial consideration.

The much-debated question whether the co-ordination of eye movements represents innate structure or acquired habit cannot be dogmatically answered. It is one of degree. Co-ordination is both innate and acquired, and variously so for different organs and different animals. The chick picks up grains of food within a few hours of leaving the egg, and after a few false shots strikes them with precision. Here the co-ordinating mechanism is complete, or nearly so, before it is used. The human infant is far behind the chick in this respect. His first eye movements, though already co-ordinated automatically for bilateral action, are purposeless, like the first movements of the limbs.[5] They have no relation to external objects. They represent activity in the lower levels or centres of the brain, uncontrolled by perception in the higher.[6] The higher levels are still undeveloped. His vision at birth is a mere perception of light. Soon he begins to notice conspicuous objects, then to recognize and follow them, and by the end of twelve months he watches all that goes on in his neighbourhood. We cannot test his vision at this age, but it is certainly not yet acute. He will pay no heed to minute objects. Even when he is old enough to learn his letters these must at first be large, and, unless I am mistaken, even when he is able to name them all he will still for a time be found unable to recognize Snellen's No. 6 at 6 metres. During these early years, too, his refraction alters.

Beginning with a considerable hypermetropia, like a lower animal, he gradually approaches emmetropia, but at 6 years of age has usually some hypermetropia still.[7] The visual apparatus with which the infant comes into the world is rudimentary; it is elaborated by use; the fine adjustments are made by practice and observation. The onset of strabismus in a young child involves an interruption and even a reversal of this process. What are the conditions which induce it?

Hypermetropia.—Grades of hypermetropia, which are exceptional among people in general, even in early life, are prevalent among those who squint (Table II).

TABLE II.—*310 Cases of Convergent Strabismus Refraction under Atropin.*

	No. of Cases.	Per Cent.	
M.	3	1	
E. to H. 1.5 D.	34	11	
H. 2.0 to 3.5 D.	106	34	88
H. 4.0 to 5.5 D.	122	39	
H. 6.0 and over.	45	15	
	310	100	

They predispose to strabismus, or actually induce it in certain cases; but the influence of hypermetropia as an essential cause has been overrated. In regarding statistics, we must remember that hypermetropia (under atropine) prevails not only among squinting children, but among non-squinting children also.[8] We must remember, too, that a considerable contingent of squinters have little or no hypermetropia, and that the vast majority of hypermetropes have no squint. The doctrine of Donders by reason of its great importance, has dominated some of us too exclusively.

The angle of the squint is not proportionate to the hypermetropia. A given effort of accommodation corresponds, in the emmetrope, with a given angle of convergence. The ordinary hypermetrope acquires the habit of converging normally, although he accommodates abnormally. The exceptional hypermetrope who fails to acquire this habit and squints instead, presents a deviation which is greatly in excess of that which his hypermetropia would seem to require.

What is the explanation of this excessive deviation? The view that it is a voluntary and purposive act for the more complete avoidance of diplopia is not altogether satisfactory, for if the extra deviation were maintained by an effort of the will, it would surely be abandoned to some extent when the squinting eye was covered, and would hardly occur at all when the squinting eye is comparatively useless, whereas it is

sometimes these useless eyes that squint the most. Is it not rather the overaction of a motor centre which has escaped from conscious control? The maintenance of fusion depends on brain action of a complex nature, on lower centres which act, when uncontrolled, without regard to purpose, and higher centres which control them. In strabismus we have probably not only exhaustion of the controlling centres, but loss of the perception which should guide the eye. The sense of fusion falls into abeyance not by the mere withdrawal of one image, as when the eye is covered by the hand, but by a purposive inhibition or suppression of it. This suppression confirms the loss of control, and degrades the act of convergence to a purely automatic level.

Failure of Control.—The onset of strabismus is often attributed to a fit, a fright, a fall, or other such occurrence, and still more often to an illness, such as whooping cough or measles. Making allowance for the frequency of such events among children, and for a certain disregard of time and sequence in their elders, it seems to me highly probable that these supposed causes are often real causes. Some such explanation of the onset was given, with show of reason, in more than two-fifths of my cases, and the proportion would no doubt have been higher had not many of the patients been brought by persons who knew nothing of their antecedents. In many cases the history was definite, and not to be upset by cross-examination. For example: A child who had never been seen to squint before came from school squinting badly, having that morning been put into a corner with a cloth over her head. Another did the same immediately after having his head pushed into a bucket of water by his brother; another after sitting in scalding water; another after being terrified by a monkey which jumped onto her shoulder. No less clear in many cases was the history of onset during measles, whooping-cough or other constitutional disorder. All these are conditions which may gravely disturb the nervous system. Shock, anger or apprehension impair the control of muscular action. Febrile disorders cause delirium, convulsions and sometimes transient strabismus, and leave the nervous energy exhausted. Is it not highly probable that such disorders occurring in young children may interrupt the action of those higher centres which control the movements of the eyes, and this not only where control is already difficult by reason of amblyopia or error of refraction, but even in children whose visual apparatus is normal for their time of life, but not yet fully developed?

Inequality of vision of the two eyes lessens the value of binocular vision, and increases the difficulty of maintaining it. It is present in a large

majority of cases. In less than 5 per cent. of my cases there was some opacity of the media. In about 50 per cent. there was a decided inequality of refraction. But apart from these causes there was an inequality of vision not removable by correction of the refraction in 78 per cent. of all the cases in which vision could be tested; slight in some, but considerable in a large number. In 23 per cent. of all my cases the squinting eye had lost the power of true fixation.

The amblyopia of the squinting eye: is it a cause or a consequence of the squint? There is little evidence to show that an eye which has once acquired good vision can lose it through squinting, but remembering how transient are the impressions received at 1, 2, or even 3 years of age—how a familiar face not seen again is absolutely forgotten—a language partly learned but not used later entirely lost—we may suspect that an eye which begins to squint before the development of vision is completed may lose something of what it has acquired. The loss of fixation power by an eye which has once possessed it is almost a proof of loss of visual power. Some of the amblyopia, however, is certainly antecedent to the squint, for many squinting children are amblyopic in both eyes, and it is clear that the defect in the fixing eye is not dependent on the squint. Seeing, then, that both eyes often fail to reach the normal standard of vision, we may reasonably suppose that the failure is sometimes unequal in the two, or even confined to one, and therefore that the amblyopia precedes the squint, and plays a part in causing it; indeed, no other view is possible where we find great inferiority in the squinting eye shortly after the onset of the squint.

But to speak of the amblyopia of squint simply as a congenital defect is misleading. All eyes are highly amblyopic at birth. Those which later reach the standard of normal vision do so by a process which occupies several years. If strabismus be established before this process is complete the further visual progress of the squinting eye is likely to be hindered, if not arrested.[9] The cases which present the greatest amblyopia seem on the whole to be those of unusually early onset. Among cases beginning during the first three years of life a much larger proportion had false fixation than amongst those beginning later (see Table I). That some beginning even in the first year retained true fixation may have been owing to the squint being alternate or remaining periodic till a later age. Moreover, the results of disuse would vary not only with the actual age of onset, but with the state of development at that age. Many squinting and amblyopic children are distinctly backward. It may be that highly amblyopic eyes squint earlier than others because they are

amblyopic, but we ought not to leave out of consideration the possibility that the early onset of squint may arrest the visual development of the eye.

Course of the Disorder.—At first the squint is usually periodic, coming and going with accommodative effort, but each lapse tends to facilitate recurrence, and in time, as the suppression of the deviating image becomes confirmed, the squint becomes continuous. It is unfortunate that so few of these children come under treatment in the periodic stage—16 per cent. in my experience—for it is then, as a rule, that the squint is cured most easily. Both in the periodic and in the continuous stage the large majority of squints are monolateral; in my cases 81 per cent. The alternating squints, constituting 19 per cent., were characterized, with few exceptions, by nearly equal refraction, and nearly equal vision in the two eyes. But the two groups are not absolutely separable. In the continuous stage, whether the squint be alternating or monolateral, the suppression of the deviating image becomes more and more complete, and the act of convergence becomes more and more dissociated from visual perception. Thus, when tested with the heteroscope, most squinters can see with the two eyes simultaneously. Some can fuse when the tubes stand in a particular position, but cannot maintain the fusion when the tubes are abducted or adducted from this position by a single degree. They have lost the notion of making a voluntary effort for the avoidance of diplopia. Some have no sense of fusion, or fuse in a spurious fashion, placing the tubes so as to blend a macular picture in the one eye with an eccentric picture in the other, according to ingrained habit. This we might expect where the squinting eye has lost fixation power, but it is surprising when met with in a patient who has normal vision in both eyes, as in some cases of alternate squint. The alternate squinter is an expert in the arts of suppression and so-called false projection. He fixes his object with either eye at will. In the other eye at the same moment, he suppresses the macular picture which he does not want, and develops to some extent the misplaced image of the object looked at, projecting it not falsely but truly, in spite of the false position of the eye.

These secondary perversions of the visual function are at once consequences of the squint and causes of its perpetuation.

Summary of Etiology and Course.—1. Convergent strabismus is a disorder of innervation in which the visual centres fail to control the act of convergence. This act is thereby degraded. It becomes purely automatic and purposeless. It is excited by the associated act of accommodation. It is excessive because it is uncontrolled.

2. The failure of control depends largely on faulty development of the visual apparatus. The fault, whether it be in the eye or in the central organs, is frequently hereditary. In many cases the power of control is lost through shock or illness during infancy.

3. Hypermetropia, when of considerable degree, predisposes to strabismus, and sometimes causes it, by demanding an abnormal effort of control, but hypermetropia of low degree does not account for strabismus in a child.

4. The disorder is confirmed and perpetuated by suppression of the function of the squinting eye. In treating it we should aim at stopping this habit of suppression, and establishing the habit of binocular control.

Educative Treatment.—In the present series of cases educative measures were employed to a considerable extent, but hardly ever alone; always, or almost always, as auxiliaries to operation and the use of glasses. Moreover, treatment was often incomplete, being abandoned or neglected by reason of time, trouble, or expense, so that the results in mass are no true measure of the curability of the disorder. Again, I have no standard of results obtained in other ways with which to compare the present. It is clear, therefore, that the question at issue cannot be answered by a mere appeal to figures. Still some numerical statement may be useful. I take for analysis 251 cases which came under treatment during the year 1897. During the last few months I have endeavored to examine the whole of this series, and am able to say something as to the present state of just 200.

Fifty-seven had binocular vision of a certain kind; they appeared under the red, white, and blue test to fuse both in near and in distant vision.

Separating the periodic from the continuous squints, I find that 59 per cent. of the former and 18 per cent. of the latter had recovered in this way.

Eleven others fused in near vision, and were not tested for distant vision, the importance of this having for a time escaped my notice.

Nine others almost certainly had binocular vision, but were too young for the actual test.

Twenty-two more fused in near vision, but used one eye only in distant vision. In these latter cases it was most interesting to observe how the child, when standing say at 3 feet from the card, would see the three dots at once, and then, on taking one step backward, being unable to diminish the angle of convergence sufficiently for that distance, would instantly suppress the use of one eye, and see two dots only.

In the remainder—that is, in just about one-half the cases of known

result—binocular vision was absent both in near and distant vision. This latter group included many patients who were cured as regarded appearance. It naturally included most of those who had false fixation at the outset, and many in which the treatment had been abandoned or interrupted.

These figures relate to fusion merely—that is, binocular vision of an elementary kind—not to the fully-developed sense of perspective or solidity. This latter was recovered in 16 cases, as proved by the drop test, and probably in others, for the test was not applied to all who had recovered fusion. The results, no doubt, are not all final. Some of these patients have the faculty of fusion on uncertain tenure, and may lose it in the future, especially if they are careless as to using their glasses. On the other hand, some who have it not will probably still acquire it, and those who retain it will certainly develop it more fully. Those especially who have it now in near but not in distant vision are likely to extend it to the latter also.

The means employed were of three kinds—occlusion of the eye by means of a shade or pad, bar-reading, and the use of the fusion tubes, these being intended as a simple substitute for the stereoscope.

The shade was employed, with more or less persistence, in 118 of the 251 cases. Its purpose is not so much to give the squinting eye a greater acuteness of vision as to compel it to use such vision as it has to promote fixation and to prevent or stop the habit of suppression. There is a period when the faculty of fixation can be saved or lost.

In January, 1897, I saw a child of 18 months with periodic squint of short duration in the left eye. The eye fixed the mirror readily as shown by the corneal reflex. Both eyes under atropine had H. 3 D. I ordered a shade to the good eye, and should probably have given glasses later, but the treatment was neglected. Fifteen months later I saw the child again, and found a continuous squint with false fixation. In contrast with this my records show 7 cases which at first had false fixation, but recovered true fixation under treatment. In every instance the recovery was aided by the wearing of correcting glasses, but it would not have come about without occlusion of the fixing eye, for it was attained before the squint was got rid of; so that without compulsion the squinting eye would never have fixed at all.

False fixation, then, though usually incurable by any reasonable amount of effort, is not always so; and in young children especially we ought to give the eye the chance. In the more hopeful and larger class where the squinting eye has still the power of true fixation, the shade is

often of distinct advantage. At first the child rebels; endeavors to remove the shade or to look sidewise from behind it; failing this, it is awkward in guiding itself, is apt to fall, is unable to put its finger smartly on a given spot; in short, has false projection through using its sight in an unwonted way. Soon, however, these difficulties begin to disappear; the shade is tolerated; the mother assures us that the child can use the eye much better, or perhaps complains that we have driven the squint into the other eye. The eye has become more useful through being used. In my series I find 10 cases which, at first monolateral, showed a tendency to alternate after persistent occlusion of the fixing eye. Such advantage, no doubt, is transient if we stop the shade and proceed no further, but when we follow it up by operation it helps unquestionably in the recovery of fusion. During treatment, the vision of the squinting eye as measured by Snellen's letters rose a little in many of my cases, greatly in a few.

Some of this improvement may have been due to the continued wearing of a proper glass, for eyes which have no squint frequently show a gradual betterment of vision during the few months following the correction of refractive errors. In one case, however, vision rose from $\frac{6}{60}$ths to $\frac{6}{12}$ths, though the same glasses were worn throughout, and had been worn for some years when the case came under treatment. In this case, together with the use of the shade, a large divergence, due to operation 8 years earlier, was corrected.

For stopping the habit of suppression the shade is invaluable. When glasses, or glasses and operation, have brought the squinting eye into fairly good position, there often remains a trifling squint which the patient makes no effort to correct. He cannot, for he is not conscious of the displaced image. By covering the fixing eye for a time we may arouse the dormant vision of the other, and he may then be able to perceive the two images at once, and to unite them by adjusting the position of the eyes. To cure the habit of suppression, the shade must for a time be worn constantly on one eye or the other: on the good eye as much as possible, and at other times on the bad one, for the squinting eye had better be in darkness than continue to form images which the brain does not perceive. Occlusion of the good eye for a certain time each day may suffice to prevent a young child from losing the faculty of fixation, but it will not banish the habit of suppression. I have usually attempted to occlude the eye by means of the ordinary celluloid shade with an elastic cord, placing the shade beneath the spectacles, but this is sometimes diffi-

cult to manage. A pad of cotton wool held in position by the spectacles often answers better.

Bar-reading, the *lecture controlée* of Javal, was employed in thirty-one cases. A bar of some kind, such as a paper-knife, a ruler, or a strip of card, is held between the eyes and the book in such a way as to hide a part of each line from each eye respectively. The patient's own forefinger will answer the purpose if held properly, and has the advantage of being always at hand. The most convenient implement, I think, is a thin strip of metal, bent in two places at a right angle so that it can be held upon the book with a thumb or finger. It is steady in relation to the book, and can be moved easily up and down the page. The patient must be taught how to use it. When his fixing eye reaches that portion of the line which is hidden from it by the bar, he must use his other eye. There must be no guessing, and no dodging movement of the head or book. At first the bar will block the line completely. To show him that the other eye can help him out if he will make it work, we cover the fixing eye for a moment with a screen. Next we teach him to occlude it for himself, at first perhaps with his hand, but as soon as possible by a momentary closure of the lids. He will learn this in a day or two if not at once. Soon he will be able to travel along the line with only a slight hitch where he closes the better eye, and at last he will read smoothly keeping both eyes open. No one who has seen a patient work his way through these several stages can doubt that bar-reading aids in the recovery of binocular vision. It is chiefly effective when practised in conjunction with the use of the shade. Its weak side is that it is inapplicable in very early life. To older patients it affords interesting occupation.

[Cases of long-standing strabismus were cited in which treatment by glasses and operation left a slight deviation, with no diplopia and no tendency to fuse, and in which the subsequent use of the shade and reading-bar restored binocular vision in the course of three to six weeks.]

The fusion tubes were used, together with other treatment, in 21 cases. The plan was to let the patient hold them in such a way as to blend the two white holes; then to separate and join these many times in succession, so as to get the idea of fusing double images. Then to overlap them partly, and try to make them go together by looking at them. Lastly, to practice this at home. Seeing that this exercise grows easier with a little practice, I presume that it serves to stimulate the sense of fusion. It is irksome if long continued, but interesting for a while, and can sometimes be managed by children who are too young for the reading bar. With

the stereoscope proper I have done nearly nothing; time failed for any sufficient trial.

The old idea that the squinting child needs a little skilful cutting and nothing more is dying out. Most people know that glasses are often necessary; but that the child may require teaching, at some trouble, to use the squinting eye is a new idea to many. But it is easily grasped, and must be grasped if our efforts are to be effective. I have used the word "educative" as a help in that direction. Of course there are parents and there are children on whom all time and trouble spent in this way are entirely thrown away, but on the whole I have been surprised at the care and patience with which directions have been carried out even in homes where one might least expect it. In this lecture I have stated only my own experience; it has been impossible to compare it with that of others. I have referred but little even to Javal, but those who know his work, especially his recent *Manuel du Strabisme*, will know how much I am indebted to it. On some points of etiology his views are, I think, open to question, but as regards the education of the visual function which he has so ably advocated, I am convinced that the principle is true and the method practically useful. Used rarely by itself, usually in conjunction with other treatment, it promotes real as distinguished from apparent cures of squint, and gives the maximum security against relapse.

References.

[1] *Manuel du Strabisme* Paris, G. Masson, 1896. [2] *British Medical Journal*, June 20th, 1896. [3] W. Preyer, *Die Seele des Kindes*, Leipzig, Grieben, 1884. [4] See Automatism and Control in Lloyd Morgan's *Comparative Psychology*, London, Walter Scott; 1894. [5] B. A. Randall, A Study of Refraction in School Children, *American Journal of Medical Sciences*. [6] *Ibid.* [7] See also Barratt and Lang, *Roy. Lond. Ophth. Hosp. Reports*.

Proprietary Preparations in Germany.—*Die Deut. med. Woch.*, 1898, and the *Woch. f. Ther.* and *Hyg. d. Aug.*, June 9, 1898, are much exercised over a certain patent proprietary preparation called "Cornesin," which is advertised to be extracted from a rare variety of South American deep sea fish and which seems to be identical with common cod liver oil. This is alleged to cure all ills the eye is heir to. Especially is it recommended to cure cataract, at 12.50 mk. a bottle. We are not the only nostrum-ridden people in the world. The "absorption cure" of cataract has evidently gained victims abroad.

SHORT ABSTRACTS FROM OTHER JOURNALS.

Statistics show that Spain contains more blind people than any other nation in western Europe. The proportion is said to be 148 to every 100,000 inhabitants.

On Nov. 2d last Dr. J. D. Timmerman, of Leipzig, O., officiated at the delivery of a baby that was born without eyes. In all other respects it was perfect, and when four months old he wrote us that it had grown as rapidly as any baby. This is the first case of the kind that has ever fallen within our personal knowledge.—*Med. Gleaner.*

Treatment of Trachoma with Iodin. R. Roselli of Rome reports 78 patients completely cured out of 100, with nascent iodin generated by administering potassium iodide internally, and when the iodin begins to be eliminated in the lachrymal secretions, he paints the upturned lid with oxygenated water. Another method is to apply to the lid 1-15 solution of the potassium iodide and then apply the oxygenated water. The generation of iodin causes a slight smarting at first, which passes away in a few seconds to five minutes.

Diphtheria of the Eye. McCollum, writing on "Antitoxin in the Treatment of Diphtheria" (*Boston Med. and Surg. Jour.*, for August 18th), mentions fifteen cases in which the sight would undoubtedly have been lost except for the heroic administration of antitoxin. In only one of those cases was there destruction of the organ, and this was in abnormal condition at the commencement of the attack. "When a diphtheritic membrane appears in the eye the effect of antitoxin on the membrane can be more carefully studied than when it appears in the pharynx. In some of these cases 2,000 units were given as the initial dose and this was repeated in six or eight hours, if there was not a marked improvement." Except in very young infants, he believes the initial dose should be 2,000 units, and in severe cases 4,000 units may be given; the more concentrated the better, as the possible source of danger lies in the amount of fluid, and not in the inherent property of the antitoxin.

Mydrin, the New Mydriatic. Dr. S. Snell writes to the London *Lancet*, July 16, saying that he desires to confirm "my observations on this mydriatic in the Clinical Journal in 1895, which were, I think, the first published in this country. I would like to add that I again refer to the value of mydrin in my volume on 'Examination of the Eye' (Pentland) published this year. My object in writing now is to reiterate my opinion of the efficacy of mydrin as a rapid pupil dilator without affecting the accommodation, and the effects of which quickly pass off, features marking it as especially adapted for producing mydriasis for ophthalmoscopic purposes. The present price of the drug is, however, almost prohibitive of its use. I understand that it still costs something like $6.25 a drachm, but of course a demand for it would soon bring about a reduction in price. It is further to be desired that some firm should furnish the drug in the form of gelatin discs."

The Histopathology of Herpes Iris. Dr. L. C. Pardee in the *Bulletin of the Johns Hopkins Hospital* for July reports two cases of this disease, with the results of a close study of its pathology. His report shows that the histopathology may be summarized as an acute exudative inflammation of the upper half of the conium, with dilatation of the superficial network of blood vessels and lymphatics (the latter being slight) accompanied by a considerable emigration of polynuclear leucocytes, which in one case became almost immediately disintegrated after leaving the capillaries of the papillæ. The latter, as the process extended, became practically filled with nuclear detritus, and, by the confluence of neighboring papillæ similarly affected, the vesicle was formed. This phenomenon of nuclear fragmentation does not appear to have been noted by any previous observer. In both cases the vesicle was formed by the lifting of the entire epidermis from the papillary body, the former becoming compressed over the vesicle in Case 1, and in Case 2 appearing swollen and edematous, and showing more or less dilatation of the inter-epithelial spaces and detachment of the cells of the basal layers of the epithelium. The contents of the vesicles were always the same, and consisted of coagulated serum, polynuclear and mononuclear leucocytes, occasional detached epithelial cells, strands of fibrin, and, in Case 1, much nuclear detritis. No infracts of blood-vessels and no hemorrhages were noted. The sweat apparatus, hair follicles and sebaceous glands were unaffected.

NEWS ITEMS.

Personals and items of interest should be sent to Dr. Frank Allport, 92 State St., Chicago.

Dr. Carl Grunert has been appointed privat docent in Tubingen.

The ninth congress of teachers of the blind was recently held in Berlin.

Leipzig. Dr. O. Schwarz has been appointed Professor of Ophthalmology.

Stuttgart. Dr. A. Peters, formerly of Bonn, has been appointed Professor of Ophthalmology.

Stuttgart. Dr. Königshöfer has received the title of Professor of Ophthalmology to the University.

Breslau. Prof. Herman Cohn celebrated his 30th year of service as teacher of ophthalmology in the University on July 24th.

Dr. George F. Keiper of Lafayette, Ind., was elected vice-president of the Indiana State Medical Society at its May meeting.

According to Snailken, many of the Moors become totally blind in late middle-life, which he attributes to the excessive drinking of coffee.

Dr. John P. Davidson has been appointed Professor of Ophthalmology in the Virginia Medical College, succeeding the late Prof. C. M. Shields.

Berlin. Prof. Silex has left his position as assistant to the Ophthalmic Clinic of the University and has opened an Eye Clinic at 31 Karlstrasse.

In order to perpetuate the memory of Otto Becker a tablet is to be placed on the house in Ratzeburg, where he was born, and his bust in the hospital at Heidelberg.

There has lately been published a work on the history of early Hispano-Roman eye practice by Dr. Rudolfo del Costello, and entitled "Epigraphia Ophthalmologica."

Budapest. Dr. Julius Fejer, who has been for many years assistant to Prof. Szilys in the eye department of the Jewish hospital, has been appointed ordinarius to the Ophthalmic section.

Good eyesight seems to be on the increase in the German army, as according to the statistics furnished by Surgeon-General Seggel, the proportion of recruits having normal vision or better is now 92 per cent., as against 56 per cent. in 1873.

The faculty of the Baltimore Medical University has been reorganized, and amongst its professors we notice the name of Dr. Theodore Cook, Jr., who has been appointed to the Chair of Diseases of the Eye and Ear. Dr. Thomas E. Poole will act as his assistant.

Heidelberg. During the meeting of the Ophthalmologic Congress of Heidelberg, the bust of Otto Becker was unveiled in the presence of a large number of friends and students. The opening speech was made by St. Bernheimer of Vienna, a former assistant of Becker's. There were present many German and foreign professors from all parts of the world.

Würzburg. When Prof. Dr. v. Michel celebrated his 25th anniversary as professor of ophthalmology, a spontaneous reception was tendered to him unofficially by his colleagues, as only 50-year anniversaries are officially recognized by the University of Würzburg. Deputations were received from the 2d army corps, his private students and student corporations, the officers of the University and of the city.

The next meeting of the Western Ophthalmologic and Otolaryngologic Association will be held in New Orleans on February 10 and 11, 1899, giving all attending an opportunity, if desired, of witnessing the Mardi Gras, which is to be held in that city on February 13 and 14. Those intending to attend the meeting should communicate with Dr. W. Schep-

pegrell, 124 Baronne street, New Orleans, at as early a date as possible, in order that suitable hotel accommodations may be secured.

St. Gallen. July 8, 1898, Dr. Theodor Bänziger, oculist of St. Gallen, died after a long illness, having reached 70 years of age. He was one of the oldest students of A. v. Graefe. In the ophthalmoscope room of the latter's clinic there is pointed out a spot on the wall which Bänziger made by throwing up his ophthalmoscope in the air in an ecstacy of joy on first observing the optic nerve in the living subject. Bänziger brought Graefe's methods to Switzerland and practiced with much success.

The Chicago Policlinic has elected Dr. G. W. Mahoney associate in ophthalmology. Dr. Mahoney has recently returned from the war, where he officiated as one of the surgeons for the 7th Illinois Infantry. He was one of the most popular surgeons that went from this state. We are sorry to hear that he has been quite ill since returning home, and the Record extends to him its congratulations for able services rendered while in the military service, and the hope that he will soon recover from his illness and be able to take up his work again in Chicago.

Drs. Wishard and Mary J. Smith are at present in charge of the American Dispensary in the Persian capital. The hospital is a well built stone building, and is visited by crowds of men and women, who flock into the different rooms. The prejudice of the people often makes it impossible to do work, especially of a surgical nature, properly. For example on one occasion Dr. Wishard removed a tumor from the eye-lid of a young woman who, with the aid of two friends, managed to keep most of her face covered with her heavy veil during the greater part of the operation, exposing only the eye, and not minding the blood, water and pain so long as she could maintain the form of hiding her face.

The St. Louis Ear, Eye, Nose and Throat Hospital, located at 500 North Jefferson avenue, St. Louis, was opened to the public April 1st, 1898. The eye department is in charge of Dr. J. Ellis Jennings, and the ear, nose and throat department in charge of Dr. Leo Caplain. The ground floor is entirely devoted to the outdoor department and is open to the poor from 2 to 4 p. m., daily, except Sunday. Care is taken to exclude from free treatment persons able to pay for professional services. The institution will be incorporated and have the privilege of giving

post-graduate courses in diseases of the eye, ear, nose and throat, and of issuing certificates or diplomas to those who have taken the courses.—*Medical Fortnightly.*

It will be of interest to those who have attended the clinics at the Illinois Eye and Ear Infirmary to know that Edgar Remington, who was Superintendent of the Eye and Ear Infirmary for many years, died very recently of heart disease. After attending to some of the business of the institution one day recently, Mr. Remington went to his room. He sat down and was talking to his wife, when he suddenly gasped and called to Mrs. Remington that he was dying. She hastened to his side, and as she clasped her arms about him he became unconscious. Doctor Bartlett, who, with Doctor Noel, had been attending Mr. Remington, was summoned, but life was extinct when he arrived. Mr. Remington's death occurred on the fifty-seventh anniversary of his birth. For twenty-five years he had lived in Chicago.

An important advancement to medical literature will be the forthcoming Sajous' Annual. An Analytical Cyclopædia of Practical Medicine," published by the F. A. Davis Publishing Company, Philadelphia. One volume will appear every six months for three years, and the subject matter will be alphabetically arranged. Each volume will cost $5 in cloth, or $6 in half Russia. The subscribers will have the benefit of a monthly cyclopædia arranged alphabetically, from A to Z, so that a doctor can have a complete synopsis of the latest journal literature to reinfore his system of reference. The volumes will be beautifully illustrated, and will be written by competent medical authorities. The most important part of the contents will be printed in large type. This will be fully supplemented by matter of a somewhat speculative character, involving theories, mooted questions, etc., in small type. This should be an important work, not only to the great mass of the profession, but also to ophthalmologists.

Dr. Albert Campbell Corr, the well-known ophthalmologist of Carlinville, Ill., was recently elected as a member of the State Board of Health, and shortly thereafter was chosen president of the Board. Doctor Corr is 65 years of age, and was born in Macoupin County, of southern parentage. He was educated in Blackburn University, where he was given his degree as Master of Arts. He served in the 133d Illinois Volunteers during the War of the Rebellion, and then studied medicine in the Chicago Medical College. He has been practising in Carlinville since

1875, and is universally respected by his colleagues. He was appointed by Governor Altgeld as a delegate to the World's Congress of Medicine at Washington in 1893. He has been president of the State Medical Society, and is at present president of the Army and Navy Medical Association. The RECORD extends to Dr. Corr its earnest congratulations for his new appointment, believing that under his leadership the Illinois State Board of Health will take another step forward.

WE GIVE THIS FOR WHAT IT IS WORTH. Dr. E. P. Daviss, *South Western Medical Record*, August, says that it is to Charles II. of England that the world owes the discovery of lenses as an aid to vision. After his escape from France, and after his father was beheaded, he became a prisoner of the great Louis XIV., and while living his indolent life in Cologne he met an expert artisan in glass, and, accidentally looking through a small lens belonging to this workman, he found that it greatly benefited his very imperfect vision. He at once bought all his lenses and took the artisan into his own employ. The young prince, born with myopic astigmatism, by mathematical calculation based upon these crude lenses, thus accidentally discovered perfection in the glasses he is said to have worn, and by which his vision was raised from one-half of normal sight up to perfect vision. These glasses are now in the British Museum and were the first spectacles ever made for visual purposes. When Charles was recalled to England and crowned Charles II., he took his French artisan and about twenty others with him, and it is said that as many as 6,000 lenses were made before he got what he wished, and what finally gave him perfect vision. These glasses, when perfected, had cost the prince over £100,000. The good, accidentally it would seem, that followed Charles' exile to France has been worth many times over to mankind the loss of his father's head, the fear of the same fate having been his incentive to flight. The Duke of Monmouth, Charles II.'s favorite son, also near sighted, had but one eye, hence the origin of the "monocle." His father's artisans improved his vision with a single lens over his better eye.

A DE ZENG refractometer, 1898 model, in good condition, can be purchased for $50 from Dr. B. M. Hanna, 812 Penn avenue, Pittsburg, Pa.

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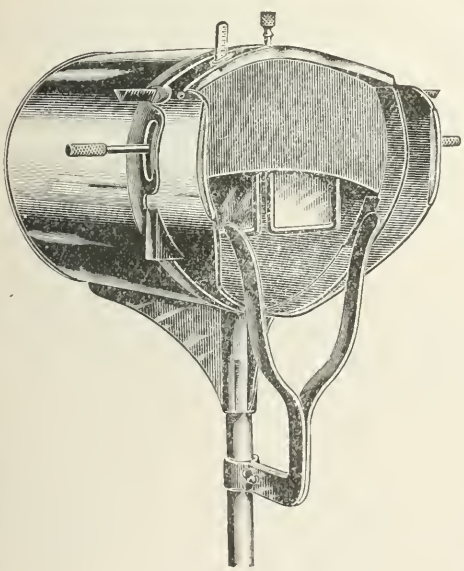

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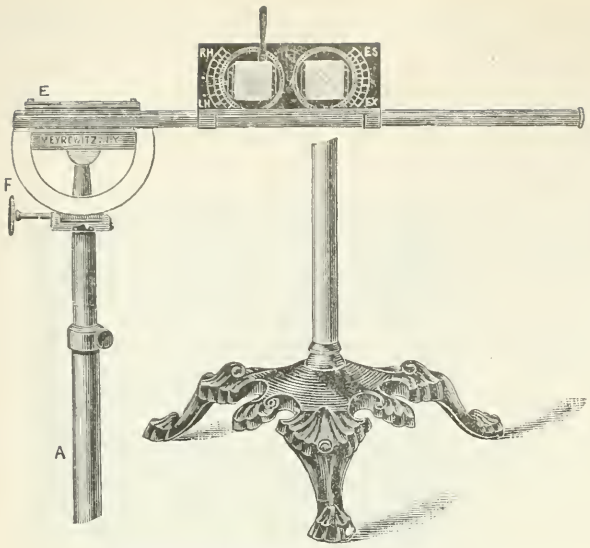

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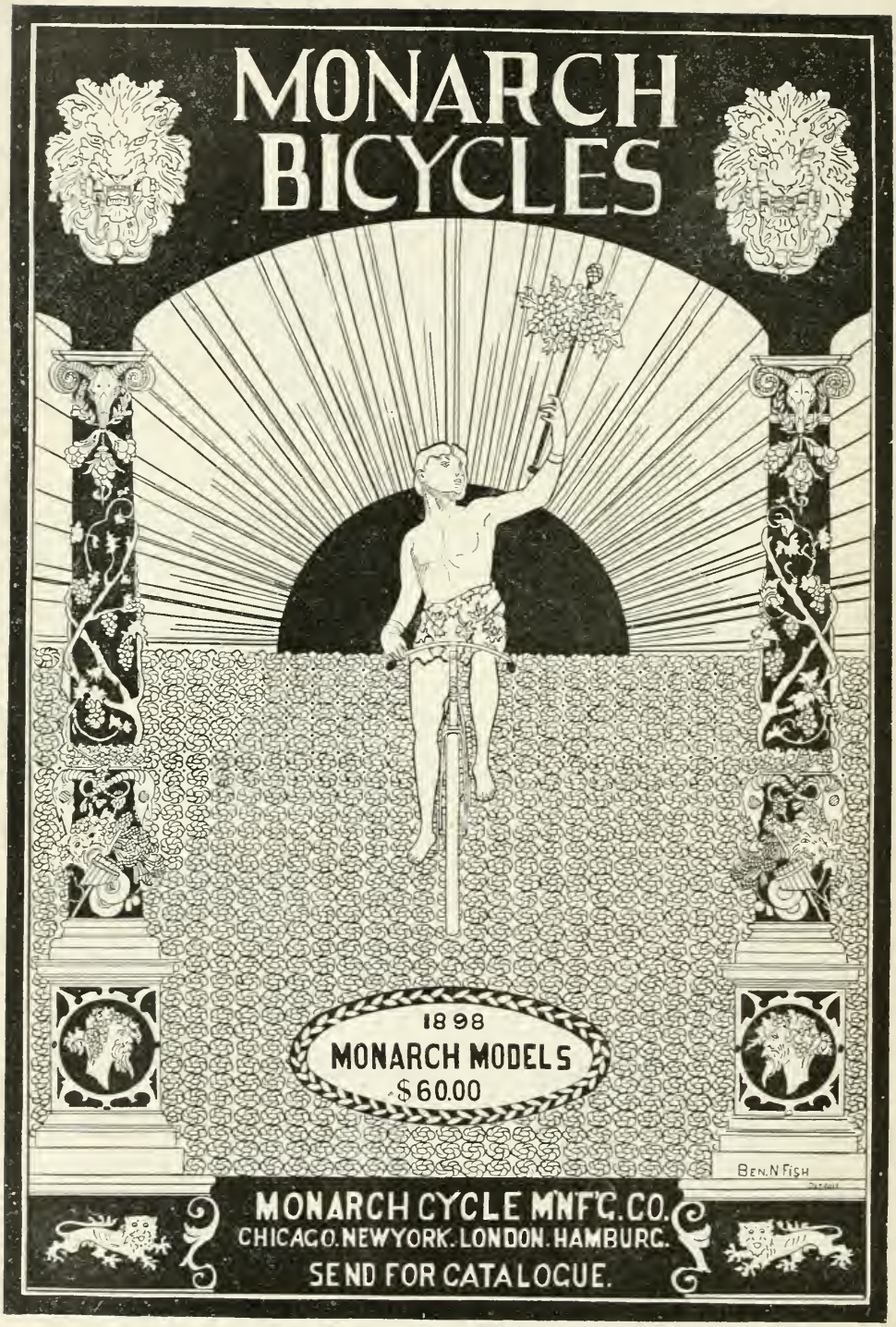
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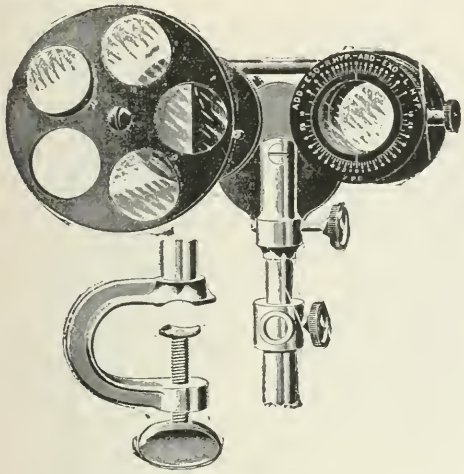

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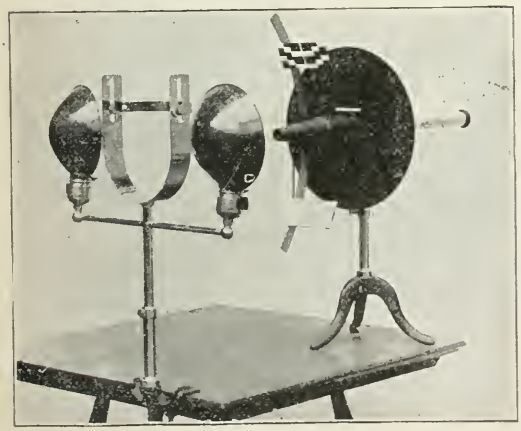

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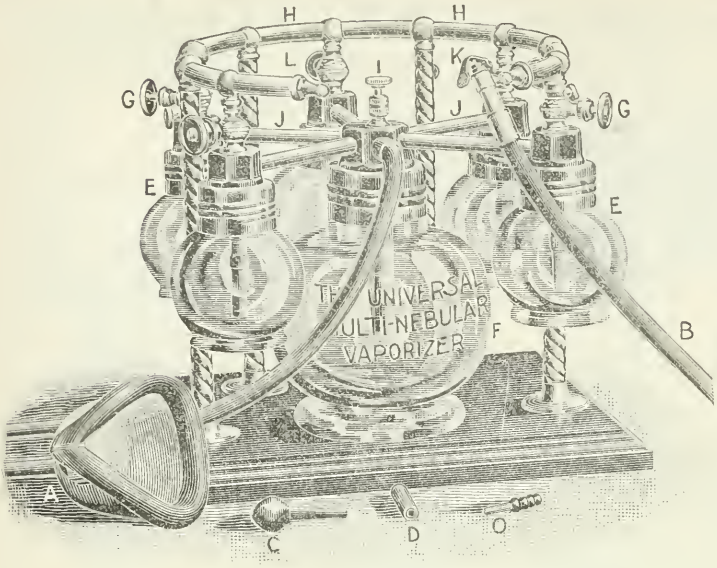

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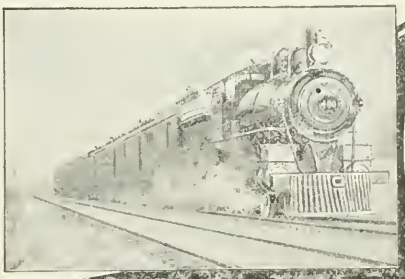

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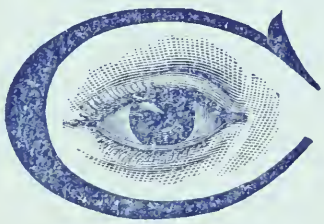
TRADE  MARK

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